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By S. E. Solly, M. D.,

COLORADO SPRINGS, COLO.,

I have the pleasure of welcoming you to the fifth annual meeting of our society and to congratulate you upon its growth and prosperity. The trite saying that it fills a long felt want is certainly applicable in speaking of the utility of our institution. That you have done me the honor to elect me your president, I regard as evidence of the recognition of that class of practitioners who, while treating a considerable number of nose, throat and ear cases, do not entirely confine their practice to that specialty. The fact that there are so many hundreds of men who are doing good work in these branches all over the country who are not pure specialists is an indication of the recognition of the value in the general practice of medicine, of the knowledge and skill in treating these diseases. So many cases of nasal and laryngeal disease are overlooked and neglected on account of the ignorance of this department of medicine among general practitioners; and also too often among medical consultants. In the larger cities, of course, it is natural and best that certain men should devote themselves exclusively to the treatment of the diseases of the upper air tract; but in less populated

places it is desirable that the general practitioner should have a more thorough knowledge and capacity for the treatment of these cases than he usually has, and this Society which allows such general practitioners to stand alongside the specialists is fulfilling a great purpose. Both classes of physicians can learn from each other; and our gatherings serve to keep the specialist in touch with general medicine which is essential to his best success, and on the other hand, enables the general practitioner to acquaint himself, and keep abreast, with the progress of this special art.

The subject to which I wish particularly to call your attention today is the unity of the respiratory tract; that while a nose and throat specialist should know all that can be learned about the upper air tract, he should also be competent to make a diagnosis of pulmonary disease, and be acquainted with the general signs of an early or latent tuberculosis and more frequently than is customary, to extend his investigations below the larynx. On the other hand, the medical consultant who is an expert upon affections of the chest, should either examine, or cause to be examined, the upper tract in many more cases than he usually does.

It is not necessary in addressing you, for me to explain the anatomical and physiological relation of the nose, larynx and lungs, or to insist on their frequent connection in pathological conditions. The facts are admitted, but practical and intelligent action taken upon these facts is much more rare than perhaps many of you suppose. As explaining why I feel justified in addressing you on this subject I must be pardoned for speaking egotistically for a brief space. I have practiced in Colorado for nearly twenty-five years, where I have had under my care and generally prolonged observation a very large number of persons affected in some portion of the respiratory tract, who for the most part were subjects of tuberculosis. During this time I have never ceased to rejoice that previous to coming to Colorado, while practicing in London, I studied and worked under that great laryngologist, Sir Morrell Mackenzie, and that I have since endeavored to keep up with the progress of the specialty. The reason is because I have found so many cases of pulmonary disease

in which the condition of the nose and throat was such that it had evidently influenced the causation of the lung affection; or that it was interfering with its progress toward recovery and if left unrelieved was liable to make the cure incomplete, or occasion a relapse. On the other hand, in cases coming to me for treatment of the nose and throat I have not infrequently found that there was also disease in the chest.

For some years in my first examinations of patients coming to me with pulmonary tuberculosis I did not examine the nose and throat, unless there was some special reason for doing so, but for the last few years I have made this examination a routine practice, as I have found that many patients who do not complain of nose and throat symptoms nevertheless have affections of this region which are important to recognize and often to treat. I believe, therefore, that in all cases of chronic pulmonary disease, the upper air tract should always be inspected.

Not infrequently patients in whom I have found abnormalities of the nose, but which had not attracted the attention of the physicians who had sent them to Colorado, have only been consciously inconvenienced by these affections after residence in Colorado. Probably because the dryness, dustiness and the diminished pressure of the air increased the turgescence of the mucous membrane and especially of the turbinate bodies. This by diminishing the lumen of the nasal passages causing more or less stenosis to arise where there was an exostosis or divergence of the septum which at sea level had caused no important obstruction; such obstruction having previously given rise to discomfort only when the mucous membrane was swollen by a passing catarrh. Such cases complain of chronic catarrh in Colorado and are comfortable still when they return to sea level.

As a rule it is best to remove the septal prominences because when those possessing them take cold they are more liable to have secondary affections of the respiratory tract lower down. The same rules, of course, apply more or less to other interferences with perfect nasal breathing, such as chronic hypertrophies of the turbinates, polypi, etc., which have escaped notice until the influence of the

air of Colorado has called the physician's attention to them.

It has been my practice for some years to take a careful history of the patients previous to their development of tuberculosis and I find that in the cases in which there is a history of frequent attacks of bronchitis and catarrhal pneumonia there generally exists more or less nasal stenosis. The number of those in whom nasal abnormalities are present would appear to be still more frequent among the cases that are subject to naso-pharyngitis, tonsilitis and laryngitis.

The influence of nasal obstruction upon catarrhal affections of the chest, it is conceded, is largely due to mouth breathing during attacks of nasal catarrh and to exposure to damp, chilly weather. As I have said marked nasal obstruction in these cases being only temporary, has not attracted the attention of their attending physician. Where pulmonary catarrh has resulted, no doubt a soil was created for the growth of the bacillus in the lower respiratory tract, while in those who have had tonsillitis it is likely that the bacilli have found an easier entrance than usual from the tonsils into the lymph vessels.

Again, in cases of unilateral nasal obstruction a catarrh of the nasal pharynx has probably allowed a readier lodgment of the bacilli in the naso-pharynx because of a sluggish air current behind the obstructed side and an entrance into the system through the glandular structure in this region. There are also cases of catarrhal affections of the upper air passages in which there may be no stenosis which nevertheless may have afforded a ready entrance for the tuberculosis. I believe that the treatment of these affections has enabled those in whom the tuberculosis has become arrested to return to their homes and occupations with much less danger of renewed catarrhal attacks and so much lessened liability to recurrence of the tuberculosis.

As an aid to the arrest of pulmonary tuberculosis, treatment of diseased conditions of the nose and throat are often of the greatest service. The cough is frequently and noticeably diminished, particularly, of course, where there has been an elongated uvula, or a hypertrophy of one or more of the tonsils. For these reasons I believe that

where a chronic affection is discovered the entire respiratory tract should be investigated and that in about 50 per cent. of the cases more or less treatment of the upper air tract is called for. It is very difficult at present to prove the truth of this belief by statistics. Dr. E. F. Ingals made a statistical inquiry into the relation of nasal disease to pulmonary tuberculosis which he reported before the British Medical Association at their meeting in Montreal two years ago.* Any communication from a physician of such wide experience and eminence in the treatment of the nose and throat is entitled to the greatest respect and consideration. He offers an analysis of 14,953 cases. Of these, 1,272 had phthisis; 4,714 had nasal disease without phthisis; 237 had nasal disease with phthisis; 6,058 had neither phthisis nor nasal disease. In considering the question of nasal disease in the causation of phthisis, he very properly writes that it is necessary first to ascertain what is the proportion of nasal disease to the general population. He estimates that 46 per cent. is the ratio of well-marked nasal disease to the population, and he concludes from his own statistics that the proportion of cases of phthisis among those with nasal disease is less than the proportion of cases of phthisis to the whole population. He, however, excepts atrophic rhinitis, in which disease he finds the proportion is greater. In arriving at his conclusions he says that Delavan, in an examination of some 2,000 skulls, found exostosis or deviation of the septum in 50 per cent. He himself estimates that 25 per cent. more of the population had other nasal affections. He, therefore, concludes that about 75 per cent. of the human race have nasal disease. He further says that it is believed that 12 per cent. die of pulmonary tuberculosis, while the number of those who recover is not known, but in 25 per cent. of the autopsies made upon people dying from other diseases there had been found evidence of old pulmonary tuberculosis. So, it may be inferred that 37 per cent. of the human race suffer from pulmonary tuberculosis as against 75 per cent. who have nasal disease, and it is also probable that many cases of

*The Relation of Nasal Disease to Tuberculosis. By E. F. Ingals. *British Medical Journal*, Nov. 13. 1897.

both diseases escape record. Dr. Ingals expresses his astonishment at these results, and admits they are opposed to his clinical conclusions.

For my part, I cannot but believe that there is some fallacy in his statistics which is not at present apparent, and one naturally demurs to his deduction that disease of the upper air passage exerts a deterrent influence upon pulmonary tuberculosis.

Dr. W. Freudenthal* thus comments on Dr. Ingals' paper:

"Dr. Ingals says that of these 38 per cent. with tuberculosis comparatively few suffer from nasal disease. Thus, for example, of his 830 cases of pulmonary tuberculosis only 237, or about 28 per cent., showed some nasal trouble. 'Of the 237 cases which make up this 28 per cent. I find that 168 consisted of exostosis and deflection of the septum, which * * * is present in 50 per cent. of all persons of the European race; *therefore, many of these would have had no possible influence* in causing the pulmonary tuberculosis.' I fail to see the logic of Dr. Ingals' conclusions. Because 50 per cent. of all Europeans have deflections of the septum, must we exclude them from our statistics? Are deflections of the nasal septum to be considered normal because so many civilized people have acquired them?

"Deflection of the nasal septum is a pathologic condition which also tends to produce post-nasal catarrh, and I consider it a very important etiologic factor in favor of our theory. But Dr. Ingals goes on to exclude other possibilities by saying: 'Further, my records show that of all the cases of pulmonary tuberculosis, 1,272 in number, only 27 of the patients, or about 2 per cent., complained of having had any previous nasal disease, which is 4 per cent. less than the normal average.' His position must be very weak if he is forced to fall back on such arguments. Were we to be guided by the complaints of the patient we would, for instance, still have to treat many cases of persistent headache as malaria and fill the patient with quinin and similar drugs, as we formerly did. We would

*Annals of Otology, Rhinology and Laryngology, p. 173, February, 1898.

never be justified in removing polypi, etc., in cases of asthma because the patient does not complain of his nose."

Dr. Freudenthal goes on to refer to his examination of the nasal passages of 500 patients in the New York Hospital for the Ruptured and Cripples, in which he found numerous cases of serious nasal disease among those who did not complain of their nose or throat. Again, he says of 75 consumptives at the Montefiore Home, 38 complained of their nose or throat, and of the remaining 37 who did not complain no less than 23 showed abnormalities in their nasal passages, and in only 14 were there no marked changes at all.

In the same article he expresses the belief that the majority of cases of permanent tuberculosis receive their initial infection from a diseased mucous membrane in the naso-pharynx. His article is well worth reading, and furnishes sound, though not absolutely conclusive, evidence in support of his theory.

He believes that partial obstruction of one nostril allows germs to settle upon the same side of the naso-pharynx with comparatively little disturbance, by air currents. Some observations of my own lend support to this theory. In a paper read by me before the Colorado State Medical Society, at their meeting in Denver, June, 1894,* I reported the results of an analysis of 200 cases of pulmonary tuberculosis. These cases were not in any way selected, but taken in the order in which they presented themselves to me for their first examination, running back from a recent date. Of these 200 chest cases, 33 had also nasal disease, 38 also laryngeal, and 23 had both in addition to their lung affection, making 56 with nasal and 61 with laryngeal complications; only clearly marked cases being noted.

The nasal cases were divided: 1st, into those in which the disease was most evident or was known to have commenced, or existed solely or mostly on one side more than the other, and these again into right or left; and, 2d, into those in whom the amount of disease or obstruction appeared about equal, and in whom there was no clear evi-

*The classification was made from the side upon which the chief cause of the disease appeared to be, rather than where its worst symptoms might happen to be exhibited later in its course.

dence of its having begun on one side more than the other, these being grouped for convenience under the head of median.

For the purpose of the inquiry as to the relation of the nasal disease to the pulmonary, the cases were again classified under right, left and median, with regard to their pulmonary disease. The side of the chest in which the symptoms first appeared, or in which it was most manifest deciding the heading, while those in which the disease was about equal on both sides, or the side of origin was unknown, or had apparently begun on both sides at once, are classified under the head of median.

Defined in this way, it was found that of the nasal cases in 24 the disease appeared to have originated upon the right side and 14 upon the left. Of the 24 cases of right nasal disease the right lung was primarily or chiefly affected in 17, the left in 1, both equally in 6. Of the 14 cases of left nasal disease, 8 were primarily affected in the left lung, 4 in the right and 2 equally in both. So that in the 38 nasal cases where the disease could be classified right or left, 65.8 per cent. had their lung disease primarily or chiefly upon the same side as the nasal disease. It is interesting to note that the case of right nasal disease in which the lung disease was on the opposite side, was one where stenosis of the right nostril had been caused by fracture of the septum, and of the 4 cases of left nasal disease where the pulmonary disease was on the right side; 1 also was known to have been a traumatic stenosis.

I have recently made a similar analysis of 100 cases of pulmonary tuberculosis, taking them in the order in which they presented themselves for examination. Of these I find 54 had also nasal disease. Of these 54 cases 31 had septal deformities, causing more or less stenosis. The remaining 23 had naso-pharyngeal catarrh without marked stenosis on either side, and in whom there was no septal disease giving rise to obstruction.

Of the 31 cases with nasal disease the stenosis was present and most marked in the left nostril in 21, and in the right nostril in 10. The left lung was chiefly or solely affected in 14; the right lung was chiefly or solely affected in 17. There was laryngeal disease in 29 per cent. of the 31 cases. Of the total 100 cases, 25 had laryngeal com-

plications, of which 21 had tubercular laryngitis and 4 simple chronic laryngitis. Five of the laryngeal cases were without nasal disease. Of the 4 cases of chronic laryngitis, all had nasal complications; and of the 21 cases of tuberculous laryngitis 16 had nasal complications.

Of the 31 cases of septal deformities there was marked stenosis, the deformity obstructing the nostril on the same side of the body as the lung which was the first and usually the most seriously affected, in 20 cases; that is, in 64.5 per cent. very nearly the same proportion as in the previous analysis of 200 cases just referred to, in which it was 65.8 per cent. In considering the cause of this curious symmetry between the nasal and pulmonary affection I wrote as follows:

"The facts would appear to suggest an underlying cause in a common deficiency of resistance to disease or injury on the same side of the body, which was probably caused by a pre-natal or post-natal imperfection of development or growth, either congenital or acquired by circumstances or habit; this developmental deficiency being one of nutrition or innervation, or both."

While this may possibly account in a measure for the nasal obstruction, and also for the progress of the pulmonary disease, yet I am inclined to agree with Dr. Freudenthal's theory, and to think that the bacilli in many cases find the readiest point of entrance in the naso-pharynx behind the obstruction. These facts and the theories deduced from them, appear to me, to enforce the wisdom of treating the respiratory tract as a whole.

THE FACIAL NERVE IN ITS RELATIONS TO THE AURIST.*

By Geo. L. Richards, M. D.,

FALL RIVER, MASS.

OTOLOGIST AND LARYNGOLOGIST TO THE FALL RIVER AND EMERGENCY HOSPITALS, FELLOW OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, ETC.

I have chosen this subject to present to you because I have thought for some time that an insufficient amount of attention was being given to this nerve in aural literature. Facial paralysis is more common as an aural complication than the current literature of the subject would lead us to expect or else my personal experiences have been especially unfortunate.

That the subject is a neglected one from the text book standpoint is easily proven by a reference to the new American Text Book of Diseases of the Eye, Ear, Nose and Throat, where no reference to the subject of facial paralysis can be found in either text or index. When it is recalled that the editor of the aural division of this book is one of our most distinguished American aurists, the contempt in which the subject is held is apparent. With the exception of the text books of Politzer, Bacon, Barr and Bishop those books which treat of the subject, do so in such a manner as to imply that the accident of facial paralysis is not of so much account after all. The index of Dr. Dench's book on the ear contains no reference either to the facial nerve or to facial paralysis but there are several short references to the nerve and its paralysis in the text, giving its anatomy, its possibility of affection in purulent and inflammatory affections and of damage in mastoid operations, ending with the astonishing statement that injury of the facial is not a serious accident as its

*Read before the American Laryngological, Rhinological and Otological Society at its annual meeting in Cincinnati, Ohio, June 2d and 3d, 1899.

function is in most cases restored in from three to five weeks under the use of the faradic current.

While I am willing to concede that affections of the facial nerve bear no relation in severity or danger to others that may occur in the aural region or be associated with the facial trouble, yet I regard facial paralysis as a by no means trivial condition; on the contrary it is a most distressing one, producing what Bishop well calls a shocking deformity. The possibility of its occurrence is always to be borne in mind by the aurist, avoided whenever possible and always treated as a serious condition. To the aurist in a large metropolitan district the occasional case of facial paralysis occurring in connection with some ear operation may not matter, but to the dweller in a small city, like myself, the presence of a person or two in the city with face drawn to one side, unable to laugh or properly close their mouth, to whistle or to close their eyes is an advertisement not to be desired. Especially is this the case if, for any reason, the doctor is given the credit of having produced the condition. Then it is freely given out that doctor so and so operated on the ear and ever since the face has been crooked. Perhaps the operation was the result of some urging on the part of the physician and the patient now wishes it had not been done. This condition of facial paralysis is a walking advertisement of the worst kind, visible to all men. Most of our aural surgery is absolutely concealed, but this part of it, or complication of it appears on the face where he who runs may read. It was said in a derisive way by the assistants in the eye department of the Halle Clinic that all of Schwartze's mastoid patients had facialp aralysis. This was very far from the truth, though it did occur now and then. Schwartze was always on the lookout for the accident and warned his students to be.

References to anatomy before this society are no doubt entirely superfluous yet I can not refrain from a brief review of the topographic anatomy of the facial nerve before going on to point out conditions in which I regard it as of concern to the aurist. Arising from the medulla it enters the internal auditory meatus with the auditory nerve, lying first to its inner side and then in a groove upon it and being connected with it by one or two fila-

ments. At the bottom of the meatus it enters the aqueductus Fallopii and follows the serpentine course of that canal through the petrous portion of the temporal bone, from its commencement at the internal meatus to its termination at the stylo-mastoid foramen. It is at first directed outward towards the hiatus Fallopii, where it forms a reddish, gangliform swelling, the geniculate ganglion, and is joined by several nerves; then bending suddenly backward, it runs in the internal wall of the tympanum, above the fenestra ovalis, and at the back of that cavity passes vertically backward to the stylo-mastoid foramen. Here it divides into main branches after passing through the substance of the parotid gland and supplies the muscles of expression of the face. Within the aqueduct it gives off the tympanic branch to the stapedius and the chorda tympani. Topographically it is in close relation to the foramen ovale, the distance from the canal at this point being but a few lines. It is also in close proximity to the deeper mastoid cells and close to the inner tympanic wall above the foramen ovale. At this point the bony partition is often very thin and may be wanting. Hence it follows that as a result of chronic processes, especially those involving destruction of tissue, the facial nerve can be injured as a result of pressure or by involvement of its neurilemma in the pathological process. This is the more likely to be the case if the process has lasted some time, though it may occur in connection with acute troubles, otitis medi acatarrhalis or suppurativa. Panzer has shown a preparation from a case of acute tympanitis in a child where the facial canal showed a defect and the perineurium and nerve fibers were affected by inflammation. This shows how facial paralysis may arise in children from acute tympanitis.

Politzer regards transitory facial paralysis more common than has been supposed. It has been observed in simple non-perforative catarrh by Wilde, von Tröltsch, Politzer and others. Weiss has reported a case of perforation of the membrana tympani with a knitting needle which was followed by facial paralysis. Cartaz reports a case of paralysis from pressure in connection with acute otitis, cured after paracentesis and another case occurring in connection with the acute earache of influenza.

Forty-eight hours after this began facial paralysis supervened. Although all the ear symptoms subsided the facial paralysis was very rebellious, requiring a long course of electricity before final recovery.

In most cases of facial paralysis coming on in the course of an ear trouble an old suppuration is probably at fault. Bezold observed this in 1 per cent. of all o. m. p cases. This has usually lasted some time and is accompanied by evidences of caries and probably granulation formation, as in the following: Female child of 6 years old, with running ears and one-sided facial paralysis, which was said to be of recent origin. Both middle ear cavities were filled with granulation tissue. This was removed with sharp curette and the facial paralysis improved, but did not entirely disappear during time child was under observation. I think the paralysis due to pressure on the nerve, the facial canal being laid bare at some point, or else involved in the chronic carious process affecting the rest of the middle ear.

Intra-tympanic operations, ossiculectomy and curettage have been growing popular of late years as a cure for old foul suppuratives. In operations of this class the close contiguity of the facial nerve and the possibility of its sheath being injured must be borne in mind. Curetting, and all other maneuvers in the region of the foramen ovale, must be most carefully done and the face watched constantly for twitching. I was reminded of this more forcibly than pleasantly some two years ago. I had operated on an old long-standing suppurative, which I had labored a year or so to heal. Under ether I removed the remnant of malleus, incus and stapes, and as there was considerable granulation tissue I mildly curetted the inner surface of the tympanic cavity. No force was used at any time, and the operation was done under good illumination. I had not noted any particular twitching during the operation, nor was I expecting any; in fact, I do not recall having considered it as a possible complication. My surprise was, therefore, great to find the next morning that the face was drawn to one side and all the evidence of a very decided facial paralysis at hand. The patient laid the stiffness of the face, as he called it, to the ether, but I knew otherwise. The tympanic wound healed

promptly with entire cessation of discharge, but the facial paralysis persisted for months in spite of the regular systematic use of faradism, galvanism, iodides and tonics; and even now, two years and more after, the recovery is not complete and he laughs somewhat one-sided and cannot whistle. Of all medical agents galvanism did this case the most good. Here the sheath, and perhaps some of the filaments were undoubtedly injured by the curette.

Bishop has had a somewhat similar case in which after an operation for excision of the ossicles through the meatus, paralysis affecting all the branches of the facial took place. Recovery took place after use of galvanic and faradic current for three or four months.

In chronic suppuration where ossiculectomy is done Burnett advises against the use of the curette even for the removal of granulation tissue. He reports 113 intra-tympanic operations without facial paralysis, in none of which was the curette used.

While I am not prepared to say, as does Burnett, that the sharp curette ought never to be used for the removal of granulation tissue in the tympanic cavity, it ought certainly to be used with care and with a due appreciation of the possibility of injuring the nerve. Whenever the dull wire curette will answer, it is preferable. It is also possible under certain circumstances to injure the nerve with the incus hook.

Even the use of the probe in these cases has its danger, though I do not know that paralysis has resulted. Strong medicinal measures used for the healing of suppurative and carious conditions may do some damage to, or excite some inflammation of the facial where there is any gap in the canal wall. There seems at present to be no way of accurate diagnosis as to the presence or absence of any gap.

Paralysis is common from pressure on the nerve at its outlet, due to purulent accumulations which break through the mastoid or glaserian fissure, or through the thin mastoid cortex of children. Such a case has recently come under my observation where a child during convalescence from scarlet fever developed an acute mastoiditis, with cerebral symptoms, and later acute meningitis. The pus worked its way to the surface in the neck near the facial nerve outlet before I saw the child, and produced a complete

facial paralysis of that side of the face. After the evacuation of the pus and operation on the mastoid the paralysis rapidly disappeared, although no treatment whatever was directed to the nerve as such, the child being too sick from the cerebral and mastoid condition. By the time these were recovered from, the facial had fully regained its normal condition.

In the various operations which are done for the relief of acute and chronic mastoid inflammations, cholesteatomata and the like, the facial nerve is to be borne in mind. It is probably less likely to be overlooked than in the tympanic operations to which I have already referred. Here, again, its topographical relations to the parts operated upon must be borne in mind, not forgetting that the mastoid is a bone with many variations, and that the depth of the nerve and its relations to the posterior wall of the external canal are such that in a complete operation it may be absolutely impossible to avoid its injury.

Barr states:

"Below the level of the antro-tympanic passage the facial nerve takes a curve downward and outward, and may be injured by the operator. This is undoubtedly a risk in all cases, and may be inevitable when the nerve is denuded of bone and imbedded in granulation tissue. To avoid it we must keep well up and away from the lower portion of the posterior wall of the external canal."

It was the rule when I was a student in Schwartze's clinic to measure the depth from surface downward, and the rule was given that exceptionally the facial nerve was met at a depth of 18 millimeters, that at 20 millimeters the greatest care must be observed, and 25 millimeters never exceeded. In four specimens recently examined I found the depth to be, respectively, 16, 18, 20, 20 millimeters.

In an article on Schwartze's Clinic, published in 1895, I stated that injury to the facial in the course of mastoid operations was not uncommon, and that the nerve was affected "not only in that portion of the fallopian canal, which is above and behind the oval window and on the lateral wall of the antrum, but also further under and outward on toward the stylo-mastoid foramen, a portion of the canal that shows in its course many variations. The

paralysis may not appear until some time after the operation. It is then the result of a peri neuritis extending from the point of injury, or caused by pressure from blood exudation in the canal. Whenever, during an operation, the region of the fallópian canal or the oval window is reached the greatest care is exercised and an assistant is told to watch for the slightest sign of spastic contraction, so as to avoid if possible any injury to the nerve." As an instance of the occurrence of paralysis some time after the mastoid operation, I have the following to report:

Miss S., aged 16 years, old purulent ear, with fever and threatening symptoms. Operation: Mastoid antrum and attic thrown into one cavity and remnants of the ossicles, with granulation tissue and cholesteatomatous material removed and bony parts curetted. The whole of the posterior bony canal was removed and the membranous wall slit posteriorly. Especial care was taken not to injure the facial nerve. The immediate convalescence from the operation was as speedy as could have been expected but the final recovery was delayed somewhat owing to the slow healing and final granulation of the extensive bony area involved in the operation. There was more or less purulent discharge for some time both through the canal and at the site of the mastoid wound. It finally healed, as I supposed, for good and the child was allowed in school, seeing me two or three times per week. One day, five months after the operation, her father brought her to me with unmistakable signs of facial paralysis. This had come on two days previously and was growing worse. The wound looked all right, and at this time I noted nothing special out of the way. I assured the father it would come all right and hoped it would. I took her out of school and began the use of iodides and strychnia with galvanism and later faradism every day. The paralysis gradually improved. At this time the original wound was all healed except a small fistulous tract at the upper portion of the mastoid wound. After the paralysis had lasted about two weeks I found some granulation tissue in the external canal, coming from what had been previous to operation the region of the attic. Removal of this seemed to hasten very rapidly the restoration of the power of the nerve. The paralysis was at no time absolute and the cervico-temporal group recov-

ered ahead of the cervico-facial ones. It was due to the too early closure of the external wound and consequent pressure from retained granulation products before complete healing had taken place in the deeper parts, combined with the fact that there must have been as a result of the old caries some point where the fallopian canal was bare. I have wondered why this did not occur in the earlier days when the amount of secretion was greater and the pressure of dressings and retained secretions would have favored pressure on the nerve. After the reopening of the wound the healing was speedy and no return of the paralysis has recurred, although several months have since elapsed.

In all operations where the attic and antrum are thrown into one cavity and the margo tympanicus with, it may be more or less of the posterior bony wall cut away, the fallopian eminence must be carefully watched and its injury avoided, for underneath this lies the nerve.

Occurring independently of any operative procedure it may be necessary to determine the exact seat of the lesion. This is not usually difficult though of course it may be. The history of the case will usually be sufficient. As an aid to this Ross gives the following as diagnostic points:

If the injury is external to the fallopian canal, the muscles of the face are alone paralyzed.

If, in the fallopian canal but below the point at which the chorda tympani leaves the facial, the muscles of the external ear are paralyzed in addition to those of the face.

If between the point where the chorda is given off and nerve of the stapedius there is in addition to preceding, abolition of taste on the lateral half of the anterior two-thirds of the tongue and diminution of the salivary secretion on the affected side.

If between the point of origin of the stapedius nerve and geniculate ganglion the same symptoms are present, together with abnormal acuteness of hearing.

If the geniculate ganglion is diseased all the preceding are present together with paralysis of the soft palate and distortion of the uvula.

If above the geniculate ganglion all the preceding are present except disorders of taste together with implication

of the auditory nerve and dullness of hearing on the affected side.

If in the pons on a level with the facial one or more of the following—hemiplegia of the opposite side, paralysis of the sixth, auditory and branches of the fifth on the same side and a staggering gait with tendency to fall towards the side affected with facial paralysis.

The question of prognosis is one of the important ones in connection with facial paralysis. Will it get well? How long will it last? are questions sure to be asked over and over again. Fortunately most cases do sooner or later get well usually completely so, but not always. Occurring as a result of congestive processes or from pressure of inflammatory products it will pass off in reasonable time provided the pressure is removed. Even here some time may elapse before complete restoration of function takes place. I do not think that we can be certain of complete recovery if the condition has lasted any length of time as contraction or atrophy of the nerve or thickening of its neurilemma may take place. Politzer remarks that "occurring in connection with suppurative ear trouble it must always be regarded as a grave affection and significant as indicating a possible unfavorable extension of the disease toward brain abscess or sinus thrombosis." Should the lesion result in actual destruction of the nerve trunk the paralysis would appear suddenly, be complete and be likely to continue unimproved. M. Furet has sutured peripheral end of facial to trapezius. Some tonicity seemed to return but the results were not brilliant. The prognosis in connection with the operative cases depends, of course, entirely on how much the nerve is injured. If only the sheath has been injured the chances of eventual recovery are good. The reaction to the electric current is a valuable prognostic sign. "At first the irritability for both galvanic and faradic currents is diminished. In a week or two the galvanic is heightened while the faradic remains diminished. As case goes on the neuro-electric effect becomes less while the myoelectric effect becomes greater." If there is no response to faradic stimulation the paralysis may be looked upon as serious. All the fibres will not be found to be affected alike, some muscles will act much better than others and tone will

come back faster to some groups than others. It has been my experience that the conditions are more troublesome to the patient when there is inability to close the eyes than when the mouth group are principally affected. The inability to close the eye produces a conjunctivitis and a degree of discomfort which is very great. As a rule I have found, fortunately, that this group were the first to regain their normal condition. It will occasionally happen that single branches remain permanently affected.

The treatment of these facial paralyses will depend primarily on their cause. If due to pressure or caries, so far as possible, the cause is to be removed. After the pressure is removed the remedies that seem to do the most good are the two forms of electricity combined with strychnia and the iodides. Of them all I regard the electric treatment as the most useful. Contrary to the experience of some I have found galvanism to do the most for me, although I frequently use both currents in the same case. Where possible I have the patient use a faradic battery several times daily at home, while I use the galvanic current myself. As faradism excites muscular contractility and galvanism acts directly upon the nerve endings, the advantage of using both currents is readily seen. The reaction of degeneration is not always a hopeless indication.

The question of mastoid operation will come up in many cases and must be decided according to the indications in the individual case. Urbantschitch regards facial paralysis as an indication for mastoid operation only when there is evidence that the mastoid is diseased.

The treatment is to be kept up for a long time if necessary, nor are we to become discouraged if at first the results of treatment are but slight. If the electrical reactions can be kept up and the nutrition of the individual muscles maintained at par or near to it, the chances of recovery, or at least of great improvement, are fair. Never say when recovery will take place. Say that it is probable that it will take place, but just when no one can tell. Even the cases that do not get completely well usually improve to a considerable extent; enough to justify all that is done in the way of treatment, since even a little improvement is worth a great deal to the individual concerned.

As a matter of precaution and of protection to the physician, it is wise in all operations in which there is any possibility that the facial nerve may be injured so to state to the patient or his friends in advance of the operation.

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ON THE USE OF RUBBER SPLINTS IN THE TREATMENT FOLLOWING INTRA-NASAL OPERATIONS.*

J. PRICE BROWN,

TORONTO.

In the August number, 1898, of the *Journal of Laryngology, Rhinology and Otology*, Richard Lake had a short article on the use of rubber splints in the intra-nasal work. I was impressed with his views at the time, as they seemed to supply a much needed want.

In my own experience, covering a period of more than ten years, devoted to special work upon diseases of the nose and throat, the evil effects of septal deformity could in the large majority of cases be removed by widening the narrow nasal passage, without resorting to fracturing or straightening the septum itself. Let a clear open chink be made, if only wide enough to prevent accumulations of mucus between the turbinates and the septum, and the catarrhal difficulties caused by the obstruction will, after healing of the mucous membrane, be in a great measure removed.

We rarely find, even in examination of healthy individuals, that the two nasal passages are approximately alike, the distance between the septum and middle and inferior turbinates on the right side differing from that on the left in the majority of instances. Still, provided the narrow passage is open, a considerable difference in the lateral dimensions of the two, will have little or no injurious effect upon the secretions of the mucous membrane.

Disease, however, arises when, from one cause or another, the septum touches the turbinate, or when the chink of the inferior meatus becomes so narrow that the mucous secretions accumulate in the passage, thereby inducing post-rhinal catarrh and preventing normal

*Read before the American Laryngological, Rhinological and Otological Society, June 3, 1899.

respiration on that side. In dealing with these cases, it is not the operative but the post-operative treatment that I have usually found the most troublesome. By saw or knife, drill or scissors or curette, single or combined, the projecting spur or ridge might be removed; synechiæ connecting the turbinate with the septum could be excised; or a partial turbinectomy, when necessary, might be performed; but to procure smooth equable pressure upon the incised tissues during the process of healing has been a much harder matter.

Some years ago a paper of mine on "Silver Tubage in Certain Cases of Septal Deformity" was read at the Laryngological Section of the American Medical Association in San Francisco, dealing to some extent with this subject. In many cases these silver tubes are useful, but in many others they are inapplicable; and in the latter class, in which the chink can only be a narrow one at best, I think that rubber splints, made as Lake advises, from thick rubber sheeting, do better work than anything else we have at our command. Their surfaces are smooth, compressible, and elastic; they can be readily cut to the required shape and they can be obtained of any thickness we desire.

After cocainizing the parts, and coating the plug with vaseline, it can readily be placed in position. Once in, it will retain its place and, by elastic pressure, give a smooth and even support to the raw surface to which it is applied, as well as prevent that profuse granulation which otherwise would sometimes occur. At the same time it does not retard the gradual extension of the new mucous membrane, while it moulds the tissues into a smooth and regular form.

The stiff pliable rubber, although not so hard on the surface, nor possessing the polish of vulcanite, is probably just as impervious to bacterial invasion. Sometimes, however, after prolonged use, it will acquire a peculiar unpleasant odor, in part arising from the rubber itself. In these cases new splints or tampons should be substituted for the old ones. As I have used these rubber plugs in a good number of instances, I might briefly quote the following ones from my case book.

CASE 1.—Oct., 1898. A boy, aged 6 years, was brought

by his mother to the Western Hospital for treatment on account of entire inability to breathe through the right nostril. This had been coming on gradually for several years, occasioned, the mother thought, by a fall on the face when two years old.

There was nothing striking about the external shape of the nose. There was, however, a marked curvature of the cartilaginous septum to the right, with a longitudinal ridge at its base. Chloroform being administered, the ridge was excised. Then to lessen the resistance, I cut into the convex surface of the curvature of the cartilage from behind forward. In one spot, although guarded by the little finger in the opposite nostril, the knife accidentally penetrated through the septum. Not heeding this, as it would probably unite by first intention, a rubber splint one-eighth of an inch thick, long enough to go beyond the triangular cartilage and as wide as the fossa would admit, was pressed into the nostril.

The child was kept under observation but the plug was not removed for two weeks. It was then found that the perforation had healed, and that the nasal passage was patulous. After cleansing, the splint was replaced and worn for several days more. The right passage was almost as large as the left and the patient was discharged, cured.

CASE 2.—Dec., 1898. A gentleman, aged 58, came for treatment for left nasal stenosis and "throat dropping." He stated that thirty years before, while at college, he went to a surgeon about his nose. The advice that he received was that there was a growth in the left nostril; but that it would be a difficult and delicate operation to remove it, and that unless it occasioned serious trouble he should leave it alone. He followed the advice given; and it was only during the last few years that it had given much inconvenience.

On examination I found a curved septum and a large round cartilaginous spur, filling up the anterior portion of the left nasal cavity. It was pointed, and impinged upon the opposite wall, just in front of the anterior end of the inferior turbinate. Behind it, the osseous septum was also curved for the greater part of its length toward the left side.

With a sharp curved knife, I excised the spur deeply, leaving a clean-cut surface. As this was followed by profuse hemorrhage, the naris was packed with absorbent cotton. On removing the tampon the following day, I found that the congested walls completely filled the cavity behind the site of operation; so after applying cocain and thus shrinking the parts, I at one slid in a rubber splint, the end being beveled to facilitate its entrance. It was made out of sheeting two-eighths of an inch in thickness. Slight irritation existed for a day or two but this soon passed away. At the end of the week it was removed. By this time congestion was over, the surface was smooth and it healed without further difficulty leaving a clear narrow chink.

CASE 3.—Feb., 1899. A carpenter, aged 23, had his nose broken when a child by a fall, producing a partial depression of bridge. For years has had almost complete stenosis on left side, resulting in pharyngeal catarrh and edema of uvula.

EXAMINATION.—Right nasal fossa enlarged, presenting concave, book-notched septum on that side. Mucosa healthy and without catarrhal accumulation. On left side, large curvature with cartilaginous spur filling in the passage, together with osseous ridge extending to the posterior choana. In the centre a bony synechia connected inferior turbinated with septum.

The first operation was to remove the cartilaginous spur and put in a thick rubber splint. Four days later the osseous ridge with synechia was sawn out, and after hemorrhage had subsided, a long splint extending to the posterior naris was inserted. For a few days it was not disturbed. Then it was taken out daily, and after being cleansed, returned. The excisions in the case were very extensive. Still in six weeks the healing was very satisfactory, resulting in a clear chink from end to end of the passage with rapid reformation of mucous membrane.

CASE 4.—April, 1899. A boy, aged 7 years, was brought as a mouth breather for treatment. He had been stunned by a blow with a stick on the forehead when four years old. From that time, it was said, nasal breathing gradually became more difficult and finally ceased.

EXAMINATION.—Curvature of cartilaginous septum to left with ridge at base, columnar cartilage curved to right, also adenoids in naso-pharynx. Chloroform was administered. Ridge was first excised with knife. Then two longitudinal incisions from behind forward were made through the cartilage on the curved side, the finger in the right nostril acting as guide to protect the mucous membrane from perforation. A rubber splint two-eighths thick was at once inserted pressing the cartilage into central position. While still under chloroform a slip from the columnar cartilage on the right side was excised, and the adenoids removed.

Two weeks later the rubber tampon was taken out; the result being nasal breathing and good left nasal passage.

CASE 5.—April, 1899. Youth, aged 17 years. Nose externally twisted to right side. Says he was struck with a ball on the nose two years ago, since which time there has been increasing deformity and considerable nasal stenosis.

EXAMINATION.—Extensive ridge spur on left side with curve filling up the fossa, part of the cartilage being adherent to the middle turbinate. Under cocain I excised front part of ridge and after compressing septum to right with chisel, inserted one-eighth in rubber tampon. Four days later, under chloroform, I made two incisions from behind forward through septal cartilage, guiding, as in case 4, by finger in right nasal fossa and thus preventing perforation of mucous membrane. I then pressed out septal cartilage by passing a two-eighths inch rubber splint. The septum being straightened, the tampon was left in for two weeks. The front part of the fossa being now freely open, a bony ridge extending along the lower part of the vomer was removed by saws, and a long wide tampon one-eighth in thickness but extending from the anterior to the posterior naris was placed in position. After the first day it created no discomfort. As patient was returning home he was instructed to retain it in position for a month.

I might say with regard to the last two cases that the cosmetic improvement will be marked.

My own experience in the use of rubber splints has

so far been very satisfactory, and I earnestly recommend a trial of them to members who up to the present have not adopted Mr. Lake's advice in this matter.

In closing I might make one more remark. I have seen somewhere that it had been proposed to manufacture a species of perforated rubber quite distinct from the tubular splints already in use, in order to allow a certain amount of respiration and ventilation through it while in position. This I think would be a great mistake, as it would destroy all possibility of keeping the splints in an aseptic condition. Another thing, the perforations would be so quickly filled with nasal secretions of one sort or other, that the object for which the perforations were made would be nullified.

REMOVAL OF TONSIL AND ADENOID FOLLOWED BY FATAL RESULT.

J. A. STUCKY, M. D.,

LEXINGTON, KY.

LARYNGOLOGIST AND OTOLOGIST TO GOOD SAMARITAN HOSPITAL.

The history of a case requiring for its relief the removal of diseased and enlarged tonsils, and the operation followed by death within a few hours, is so unusual that I have thought it of sufficient interest to bring it before you for consideration and discussion.

J. A., aet 15, consulted me February 21, 1899, giving the following history: Had been in bad health for the past two months, caused by attack of "grippe," though not confined to bed or house; had been at school most of the time. He had been suffering with sore throat, tonsillitis and quinsy; being much worse for past two weeks, although he received the best medical attention. The throat trouble was aggravated by a "hacking cough." The attending physician referred him to me to have his tonsils and adenoid removed, as the only method of relief.

The appearance of the patient bore every evidence of genuine illness. For some days he had been having rigors and hot flashes at short intervals, accompanied frequently by profuse sweating. He was pale, except for the hectic flush; pulse quick and full. Complained of constant headache, and had the characteristic expression of a mouth breather from adenoid obstruction. Temperature 101° F., tongue coated, breath offensive.

Examination of the pharynx showed the left tonsil enormously enlarged, protruding beyond the median line, of soft, spongy and granular or fungus appearance. The tonsillar crypts and follicles were filled with offensive pus, evidently oozing from an old peri-tonsillar abscess. The anterior and posterior pillars were adhering to the tonsil in such a way that the tonsillar mass prevented free drainage

of the abscess. Pushing the tonsil to one side gave freer exit to retained pus. Several small abscesses were noticed along the alveolar border, and the gums were soft, spongy, bled freely and were soaked with pus. The pharyngeal vault was filled with adenoid vegetation, covered with offensive discharge, similar in every respect to that in the tonsil.

There was entire absence of indications of active inflammation, no redness or marked induration being noted. A diagnosis of general septicemia due to auto-toxemia was made, and removal of diseased and suppurating tonsil and adenoid advised.

This was consented to, and the patient sent to St. Joseph's Hospital. Dr. John Scott, after examination of the patient, said there was no contra-indication to administration of an anesthetic, and gave him chloroform, after the parts had been thoroughly cleansed with antiseptic solution by means of atomizers. Very little anesthetic was needed, and was taken without an unpleasat symptom. The throat being large, every step of the operation was easily and quickly done. The tonsil was removed with tonsillotome, adenoid with Gottsein's curette. There was little more than the usual hemorrhage, and, after spraying the parts with iced hydrogen dioxide solution, the patient was put to bed in good condition. On account of the general septic condition and suspecting him to be a bleeder, I remained an hour and a half after he had recovered from the chloroform administration, and left him in good condition and quite cheerful. Instructions were left with the nurse to use iced spray (25 per cent. hydrogen dioxide in Seiler's solution) if there was any free oozing of blood.

Within thirty minutes after leaving him a hurried telephone message was received, saying patient had just vomited, and was bleeding profusely from nose and mouth. I was at his bedside within 10 or 15 minutes; the bleeding had checked considerably under use of the spray. Pulse was quick, expression anxious, great restlessness, and every indication of impending collapse. A hypodermic injection of ergotine 1/10, strychnia 1/30, and morphia 1/6 grain was ordered, while I proceeded to thoroughly remove all blood and clots. Examination revealed no

special bleeding point, but a very general oozing of venous blood; very little arterial oozing was found. Most of the bleeding was from the tonsillar and post-pharyngeal surface. After drying the parts, an application of McKenzie's styptic solution, followed by ferri per-sulph., applied by means of cotton covered probe, effectively stopped all bleeding.

Before completing this treatment Drs. Scott, Kinniard and Patterson arrived, approved of the treatment pursued, and agreed with me that the patient would probably soon react and rally if there was no further bleeding. After waiting a few minutes, the pulse being fairly good, though weak and irregular, it was decided to use transfusion of hot normal salt solution. Within three hours three pints were used subcutaneously, and readily (apparently) absorbed. Whisky, strychnia and digitalis were also given hypodermically, as indicated. Efforts to sustain life by these means failed, and the patient died nine hours after the operation, and seven and a half hours after the secondary hemorrhage had been controlled. As to the imperative and immediate indication for the operation, there is in my mind no doubt. I am equally positive that death in this case was coincident with the operation, the latter being the exciting not the immediate cause.

It is well known that no operation (when indicated) gives such remarkable results as that for the removal of adenoid tissue; also their removal is accompanied by very free venous bleeding. In this case the loss of venous blood at the time of operation was little more than is usually the case, and all the bleeding stopped within a short time without the use of any styptic except iced spray of hydrogen dioxide and alkaline anesthetic solution. Within a few moments after the appearance of secondary hemorrhage I had thoroughly cleansed all bleeding surface; there was no special bleeding point discovered, and no evidence whatever of a vessel of any size being severed, but instead there was a very rapid, free oozing of venous blood, which was easily controlled by the application of the styptic referred to.

The most plausible theory, to my mind, as to the cause of the death is that the entire system, with all its recuperative force, had been so exhausted and undermined by sep-

sis that reaction was impossible, although every facility for promoting this was easily at hand and freely used. I know of no other way to account for the result, because I do not think enough blood was lost to cause death, and this did not occur for seven and a half hours after the bleeding was completely controlled. Admitting the hemorrhagic diathesis does not account for the unexpected and terrible result, I am forced to the conclusion in this case that I was dealing with a septic condition of affairs, that nothing short of what was done would have relieved the patient, complicated with a hemorrhagic diathesis, and that "something which passeth understanding."

DISCUSSION OF DR. STUCKY'S PAPER.

Dr. H. H. Curtis, New York:—Mr. President: I should like to say a word of sympathy for the doctor. We are fortunate if such a result has not come to us individually, for we know such cases will happen. I was going to operate upon a young man for trouble in the nose, in a prominent family in New York. I was about to operate on Monday. I felt his hand and said to his father, "that boy is not well." I took his temperature and found it 104.5°. The boy died on Thursday from pyemia. If I had operated upon him on Monday he would probably have died on Thursday anyway, and it would have been one of those cases such as the doctor spoke of as coincident. I tell all patients who come to me to operate on the tonsils, that there is danger of about one to forty thousand and if they are willing to take that chance I will operate. I think no criticism should be made on the case reported by Dr. Stucky.

Dr. Robert C. Myles, New York:—Dr. Stucky's case confirms something that I observed yesterday, that is that the statistics of the world belong to us. If his patient had been under our care we would have had the same misfortune. No power could have been brought there to change the result. It is very probable that the depression of the

child and the extreme condition he was in from the septic poisoning, combined possibly with a reseasonable amount of hemorrhage, contributed to the shock. A great many surgeons think shock is due only to hemorrhage, but I think there is a great deal else contributed to shocks. It is my impression that the boy died of that, combined with his weakoned condition.

Dr. Charles W. Richardson, Washington:—I would like to ask whether the temperature was taken and whether there was any question of the presence or absence of fever. Was there any septicæmic temperature?

Dr. Stucky:—The temperature was taken four hours before the operation and it was 101°, and after cleansing the parts thoroughly and giving the child a dose of salicylate of soda, to relieve his headache, his temperature dropped to 100.2° at the time of the operation.

Dr. Price-Brown, Toronto:—The gentleman could do nothing but use the best judgment he had, and I have no doubt if one of us had had the case we would have done the same as he did. It is an unfortunate result, but I do not think Dr. Stucky is in any way to blame for it. Physicians often go a lifetime without seeing such cases, yet sometimes we meet them and we are blamless of the results. I want to mention a case that resulted almost fatally in the practice of a gentleman I know. The operation was a tonsilotomy. There was slight hemorrhage for a short time and then relief. Later hemorrhage again came on more severely and the patient bled several quarts before it could be stopped. Every effort to relieve it was in vain and the patient went almost into syncope before it was finally stopped. I will also mention a case that I saw, in which there was septicemia. It was a death following the removal of adenoids by the same method used in this case. Notwithstanding all that could be done the patient died. Upon autopsy examination, it was proven that the internal carotid artery was out of its normal position and had been opened. It was impossible at the time of the operation to tell that the artery was not in its normal position. These unfortunate cases will occur, and I think Dr. Stucky is in no way to blame for the results in the case he reported, and he certainly needs our sympathy.

Dr. T. V. Fitzpatrick, Cincinnati:—I disagree a little with the last speaker in saying that Dr. Stucky needs our sympathy. I think he does not need our sympathy, for he discharged his duty just as he should have done. I recall a case of operation for adenoids, in which I operated in the face of a temperature of 103.5°. After operation and drainage the temperature fell to normal. The case was not complicated by any rise of temperature. I think the doctor managed his case as well as could be, and under such circumstances the physician must simply "take his medicine." which Dr. Stucky knows how to take very well.

Dr. Ewing W. Day, Pittsburg:—Cases like Dr. Stucky's are indeed unfortunate, and make a physician timid and liable to shirk his duty from fear of like results. In this case I do not believe the operation was the important factor, but an unfortunate coincident, that is liable to happen to any of us. The amount of hemorrhage was certainly not more than we often encounter. There is such a thing as cowardly surgery, if I may so call it, when a timid man fails to do the only thing that can give relief, from fear that his reputation may suffer if the operation is not successfull. If Dr. Stucky had been influenced by these considerations and allowed his patient to go on each day coming more deeply under the influence of the septic poison, he certainly would have shirked what was his plain duty.

Dr. J. E. Sheppard, Brooklyn:—I look upon it as purely a piece of luck that I have not had one of these cases. I have a sort of wholesome fear of it, for I am advancing in years and know that I must be nearing my fatal case.

I use the galvano-cautery in these cases. It seems to me the absorption of toxines or toxic poison must play an important role in these cases. I do not think this case would have died but for the toxic poisoning. Those of you who have not seen what the toxines will do, can hardly understand it. But those of you who have seen even a tenth of a minim of the toxin of erysipelas produce a very high temperature, will not believe it improbable that this case died from toxin poisoning. Possibly the hemorrhage

had something to do with it, but that the patient died from hemorrhage I am very doubtful indeed.

Dr. J. A. Stucky:—I believe if I had not operated on this case I should have been guilty of criminal neglect. If I had a thousand cases to confront me, one right after the other, I should advise the same thing and do the same thing in the very same way, if the patient and the friends would consent. It is just one of those little cyclones that strike a fellow now and then. To have done this kind of work for twenty years and then have it occur, makes one feel "a little bilious." But I think you will agree with me, if I had done anything less than I did, I would have been guilty of neglect.

THE QUESTION OF POSTICUS PARALYSIS, PART II, AND THE INNERVATION OF THE LARYNX DURING BREATHING.*

A. KUTTNER AND J. KATZENSTEIN,

BERLIN.

Translated by CLARENCE LOEB, A. M., M. D., St. Louis.

I. Semon's law, its historical evolution and its foundation.

II. Grossman's hypothesis and its refutal.

III. The removal of the posticus in experiments on animals, formerly and at present.

IV. Semon's law in the light of recent experiments on animals.

V. The dilators of the glottis and the innervation of the larynx during breathing.

Grossmann's article in opposition to Semon's law, which appeared in Vol. VI of the *Archiv. für Laryngologie* we called forth a large number of replies, all† of which, with the exception of one by H. Krause,‡ have proved unfavorable to Grossmann. In the Vol. VII, of the *Arch. f. Lar.*, likewise took a position on Grossman's hypothesis and we explained that it appeared to us untenable. We then continued our experiments, in order to arrive at an opinion as to how far experiments on animals could settle the vexed question.

I. SEMON'S LAW, ITS HISTORICAL EVOLUTION AND ITS FOUNDATION.

Semon took the position, by reason of many facts which have been known for some time and whose interpretation then appeared free from objection, that, in a progressive disease of the recurrent, the fibres of the abductors suffered first while the adductors were affected later in the course

*Archives für Laryngologie, Vol. IX, p. 308.

†Vol. VI, VII, VIII Archives für Laryngologie.

‡Arch, f. Anat. u. Physiol., 1899, Physiol. Abtheil s. 77.

of the disease. The laryngeal picture which portrayed the three steps of progressive paralysis of the recurrent was already known; likewise the limitation of the outward movement, caused by the simple posticus paralysis (stage I), the median position, corresponding to paralysis of the posticus with secondary contraction of the abductors (stage II); and the cadaveric position, the sign of complete paralysis of the recurrent (stage III). The explanation, at first purely hypothetical and obtained by exclusion, that the first two stages were due to a lesion of the posticus, gained a strong support when Riegel proved in a post mortem that the clinical median position had a palpable degeneration of the abductors as an anatomic substratum. A further proof for the statement that the median position was to be explained by a paralysis of the posticus, was found in the results of v. Schechs* and Schmidt's experiments on animals. They found that in dogs, when both postici had been severed, 48 hours after the operation at the latest, there appeared a median position of both vocal bands, which irrevocably, without artificial aid, resulted in death by suffocation. Furthermore, the observation had been made in the clinic that Stage I can gradually pass into Stage II, and further, that the median position can change into that which, since the time of Legallois, has been recognized as characteristic of paralysis of the whole recurrent.

Semon found these facts, which then were unopposed by any argument, already prepared for him. From these and from his own corroborating experiments, he formulated his law which, without giving any explanation whatever, was the simple statement of the conviction that in a gradually progressing disease of the recurrent, the succession of phenomena takes place in a fixed and regular manner. When on the contrary, Grossmann maintained that Semon's law is a purely theoretic hypothesis for which clinic and pathologic results gave only supplemental support, his assertions are completely contrary to the facts.

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*Schech. Experimentelle Untersuchungen über die Nerven und Muskeln des Kehlkopfes. Zeitschr. f. Biolog. Bd. IX, 1873, p. 258.

Schmidt, Die Laryngoscopie an Thieren. Tübingen, 1873.

Archiv. für Laryngologie, Vol. VII. p. 370.

II. Grossmann's Hypothesis and its Refutal.

In part I of our paper we noted the objections raised by Grossmann against Semon's law, *i. e.*, not so much against this law itself, as against the interpretation of the clinical picture on which it is based. He maintained that Stage I (the simple posticus paralysis) has never yet been observed by anyone. In opposition to this we, as well as Semon, had furnished proof that this very laryngeal picture has been seen in practice and described by more than 20 observers though Grossmann pictured it theoretically. Regarding the Stage II, he claimed that in dogs, we obtain the picture corresponding to the clinical median position (adduction position, as he calls it) if a simple section of the recurrent is made, and that this position passes over into the actual cadaveric position if the section of the recurrent is followed by that of the superior laryngeal. From these experiments he drew the conclusion that the clinical median position has nothing whatever to do with a posticus paralysis. After checking over Grossmann's experiments, step by step, with an equal degree of care and with the same measuring instruments, we think we have proved that the position of the vocal bands in animal experiments, after section of the recurrent, is very different from the clinical median position to which, according to Grossmann, it should be analogous, and that every conclusion, therefore, which is based on the asserted congruence of both laryngeal pictures is fallacious.

III. The Former and Present Elimination of the Posticus in Animal Experiments.

After we had come to the conclusion that Grossmann's hypothesis was untenable in consequence of the considerations outlined above, we proceeded further in following up the above mentioned line of thought, namely, to imitate by means of removal of the postici muscles those conditions which we accept in the clinic as the basal facts of the laryngeal picture in question. These experiments, as we have indicated above, were carried on by Schech and Schmidt more than 25 years ago, and the results obtained thereby formed, at that time, a weighty support for the belief that the median position was caused by a

posticus paralysis with secondary adductor-contraction. Grabower, Klemperer and Grossmann took up these experiments and their results have been published coincidentally.

Differing from other investigators, who use simply estimates, we carried on this part of our work in such a manner that, by means of Musehold's laryngometer telescope, we were able to measure exactly every separation and every oscillation.

In the beginning we conducted the operation in such a manner that we made a lateral passage to the postici muscles. Thus, we obtained on the whole the same results as Schech, Schmidt, Grabower and Klemperer. Later we changed our method of operation and made an entrance in the manner lately described by Grossmann.* We cut directly across the trachea about 2 cm. below the larynx, separated the upper part of the trachea and the larynx from esophagus, which was then turned upwards, whereby the posterior wall of the larynx with the postici was laid bare. After removal of one or both postici, both segments of the trachea were joined together by 4 to 6 sutures.

The results obtained by these proceedures were usually different from those by the methods which were previously used. Formerly, after bilateral section, at the latest 48 hours afterwards, a median position of both cords appeared, and in addition the highest degree of dyspnea which, in absence of artificial help, terminated in death by suffocation. This result was one of the chief supports for the theory of the relationship between median position and posticus paralysis.

This new method of experimentation taught, that median position and suffocation are by no means a necessary consequence of the removal of both postici. We can therefore not deny that the results abtained by the lateral method are influenced by accessory injuries and that the newer mode of operation, which with an equally careful removal of both postici, does not cause median position and suffocation, furnishes more unobjectionable results.

We removed the postici in about 50 dogs on one side or bilaterally and obtained the following results:

*Pflüger's Arch., Vol. 73, p. 184.

1. The vocal band robbed of its musculus posticus can not be abducted to the same degree as before; the maximum of abduction is now nearer the median line than before. Within the possible latitude of oscillations the rhythmic respiratory movements and the phonation movements are preserved.

2. During quiet respiration the respective vocal band is not abducted beyond the cadaveric position, as is the case after section of the superior laryngeal nerve. In forced respiration the outward movement goes beyond this measure.

3. Animals, in which both postici muscles are removed, do not show median position and do not die of suffocation. In quiet attitude the respiration is, it is true, audible, but not forced. During motion or psychic irritation dyspnea sets in, which, with complete median position, may cause suffocation.

4. The mode of movement of the vocal cords robbed of their postici muscles, suffers no variation at all, even if the animal is kept alive as long as a year after the operation. We cannot notice especially any approach of the vocal bands to the median line, any interference with the adduction or abduction movement, and any median position.

These results agree entirely with those obtained by Grossmann, but contradict in an essential point the theory lately advanced by Klemperer* on the ground of some new experiments. He never saw, after removal of the postici, an abduction greater than the width given by the cadaveric position. We have been very careful on this very point, and on the ground of correct measurements repeated time and again. We must decidedly hold the position that, after total removal of the posticus, the outward movement may excede the cadaveric position obtained by section of both laryngeal nerves.

IV. Semon's Law in the Light of New Animal Experiments.

What, then, are the conclusions which may be drawn from the above facts affecting Semon's law and what are

*F. Klemperer: "The position of the vocal bands after removal of the crico-arytenoid. post. Pflüger's Arch., Vol. 74, p. 272."

the objections raised by Grossmann against the latter?

In regard to Stage I, the simple posticus paralysis, we have already stated the fact that numerous observers have described laryngeal pictures which are explained on the basis of a single posticus paralysis. Grossmann did not know of the cases, hence his erroneous statement that no one ever saw the simple, uncomplicated paralysis. These clinical pictures conform in the most complete way to those obtained by animal experiments. Here, as in each case, the outward movement is lessened; the affected band lies closer to the median line, and from this position its rythmic respiration and phonation movements continue. The whole deviation from the normal consists in the fact that abduction and adduction no longer takes place to so great a degree. The analogy of the clinical laryngeal picture and that obtained by animal experiments is a complete one and, if anywhere, we must here recognize the evidential strength of animal experiments, i. e. we must recognize that the clinical picture for which we claim that it corresponds to the Stage I of the progressing recurrent paralysis, is due to a disease of the abductors.

The observation had been made in the clinic that, in individual cases, the picture of a simple posticus paralysis suffers a change in the course of time. The vocal bands very gradually approach the middle line, the range of motion still remaining becomes smaller and smaller, and finally ceases entirely at the moment when the vocal bands attain the median position. Riegel, confirming this appearance, has expressed the opinion (Semon only accepted it) that there occurs after the paralysis of the abductors a gradual contraction of their antagonists, the adductors. The gradual transition from Stage I to II, seemed to speak for this opinion; then the results of the Schech-Schmidt's experiments, and, finally, the results of the microscopical experiments were not inconsistent therewith. The later experiments in section of the posticus destroy an important link. Since in this chain of argument apparently so well made, they show that the removal of the abductors, by no means as heretofore believed, must necessarily be followed by a contraction of the adductors. For one year after the operation, the vocal band deprived of its posticus was just as movable and just as

far from the median line as immediately after the removal. We are unable to explain the contradictions between our observations and the later ones of Klemperer (l. c.) who obtained a gradual approach of the vocal bands to the median line. Our statements in regard to this point are in agreement with those of Grabower and Grossmann. We must, therefore, confess that we cannot experimentally obtain the median position by a simple removal of the posticus. Does this, then, oppose Semon's law? We think not. In the first place, it was already known, from clinical observation, that Stage I remains in some patients years at a time without the occurence of a contraction of the adductors, i. e., a median-position; we ourselves have observed such a case for about two years. In other patients, the change from position I to II occurs sometimes earlier and sometimes later. Does not this irregularity of cases argue with greatest probability for the fact that if this transition is to occur, some circumstance which exerts the determining influence must occur?

This belief obtains a still greater measure of probability if one examines the cases in which the vocal bands alternately assume one or the other position, as the history of the following case shows:

In the fall of last year, there appeared in the polyclinic of one of us (Kuttner) a railroad employee from Frankfort who suffered from asthmatic trouble. The thoracic viscera showed no anomalies; the examination of the larynx, however, showed that the glottis could not be opened more than 4 mm. Both vocal bands stood and moved symmetrically, made rhythmic respiration movements, and came together in the median line on phonation. The voice sounded somewhat hoarse; dyspnea was not present except when the patient exerted himself. After diligent questioning, we learned that the so-called asthmatic attacks were always accompanied by a cramp-like feeling in the throat. Further examination revealed a difference in the pupil. We decided upon a diagnosis of tabes incipiens, and concluded that the asthmatic attacks were nothing more than laryngeal crises. Our opinion was confirmed by Dr. Rothmann, a nerve specialist, whom we consulted.

For two weeks we treated the patient by the fa-

radic current; no attack appeared during this time. The patient then returned home, but came back in about two weeks with the statement that he had suffered greatly while at home with attacks of suffocation. The laryngeal examination revealed that the left vocal band now stood just in the middle line and no longer made any movement; the right continued its excursions formerly observed, and moved from the median line as far back as 2 mm. The maximum of glottic width was no longer 4 mm., but was only 2 mm. During the examination, the patient was opportunely seized with an attack of suffocation. We could then see that even the right vocal band, in its ligamentous part, was drawn into the middle line and lay close to the left, while only in the cartilaginous part there remained a narrow space of about 1 mm. breadth, through which the air laborously was forced. For four days the right vocal band maintained its median position unchanged. On the fifth day after his return, it went back again to its former position. The glottis then again showed a breadth of about 4 mm. and the left vocal cord also once more commenced its movements. During this time a symptomatic treatment only was employed.

This observation teaches, in our judgment, with absolute certainty that position I, corresponding to simple posticus paralysis, can, under the influence of a new factor, change to position II, corresponding to the median position. This factor is lacking in our animal experiments, and that, in our opinion, is the reason that here Stage I does not pass over into Stage II.

But what sort of a thing is this factor? That it is not to be sought in Grossmann's hypothesis, is evident. The median position could never have yielded to that mobility of position I, if it had been caused by a total recurrent paralysis. We see no possibility of explaining the above case other than that an irritant of some kind caused temporary contraction of the adductors.

Can we imitate this condition in animal experiments? Experiments, which we have undertaken in this connectioon, have shown that we, as all our predecessors can not evoke the picture of median position exactly corresponding to reality, but can bring about something similar.

If, for example, a thread is loosely tied around a recur-

rent, the movements of the affected vocal band will cease and it takes a position nearer the middle line. If now the recurrent of the other side be severed, there is seen, if the thread be tied neither too loosely nor too tightly, an unmistakable asymmetry in the glottic width. It forms an approximate right-angled triangle; the right angle lies on the side of the tied recurrent. Faradic excitation of this nerve (the electrode must be placed about 2 cm. toward the center from the site of the thread) shows that the conduction is interrupted. After a longer or shorter period, in two cases about 20-30 min., this mędian position passes away and the vocal band lies symmetrical with that of the other side whose recurrent has been severed.

The result of this experiment agrees with similar observations of Krause,* Semon, Katzenstein and others. We think we may conclude that in all cases where the interruption of the conduction recurrent occurs in an irritated rather than normal condition, there will be found an irritation of the part lying peripheral to the point of irritation which finds its expression in an approach of the vocal band to the median line beyond the cadaveric position. Sooner or later this irritation ceases, and there appears the position corresponding to total recurrent paralysis.

We are confident that these experimentally prepared laryngeal pictures are indeed similar to the clinical median position and perhaps give an indication as to its meaning; an analogy to these does not, however, exist there, for if the experimental median position can and does last only a few days, the clinical, on the contrary, persists for months and years—through the kindness of B. Fränkel† and E. Meyer we were made acquainted with a case of double sided median-position lasting 23 years. We see a difference greater than one of degree, and we must insist that no one has as yet been fortunate enough to obtain experi-

*We mean here the observations which Krause related in his first work, Virch. Archiv., Vol. 98, 1894. The refutation in the actual observation of these and his last work (Arch. für Anat. u. Physiol., 1899, Physiol. communication) we cannot give.

†B. Fränkel—Laryn. stenosis following weakening of glottis abduction. Deutsche Zeitsch f. pract. Medicin., 1878. 6 and 7; A. Rosenberg, Vol. VIII, Archiv. für Laryng., page 13, case 10.

mentally a true analogy to the clinical median position. In the recognition of this fact, we see the great weakness of Grossmann's hypothesis.

From all these experiments and reflections thereon, we deduce the following conclusions regarding Semon's law and the grounds on which it is based:

I. Stage I of the simple posticus paralysis has been repeatedly observed and described. The removal of the posticus in dogs gives essentially the same conditions which we see in the clinic.

II. A condition analogous to the clinical Stage II, median position, does not occur in dogs after the removal of the posticus. This circumstance argues against the theory that every posticus paralysis necessarily involves a contraction of the adductors leading to a median position. We have not yet been lucky enough to produce experimentally the exact picture of a median position. That laryngeal picture, which in animal experiments, yields certain similarity, teaches, in agreement with clinical observation and autopsy records, that this Stage II, the median position, appears when there is added an irritation of the adductors to paralysis of the abductors.

That this explanation is the correct one for certain cases of median position seems to us without doubt. Whether it is the only one and fitting all cases must be tested by further experiments. Grossmann's hypothesis that the median position, after total paralysis of the recurrent, results from the influence of the cricothyroideus we consider false.

III. Animal experiments, in agreement with cinical observation, show that paralysis of the recurrent is necessary for bringing about the so-called cadaveric position. That the cricothyroideus does exert an influence on the paralysed band is not denied. But its influence on the conduct of the paralyzed vocal band, and, above all, the length of the influence are so minimal that by the clinical observation of individual cases, which ought to last more than a few days, a determining rule cannot be assigned to it.

We thus come to the conclusion that there actually is a simple, uncomplicated posticus paralysis and that only the question of the nature of the complicating factor requires

further elucidation. The fundamental facts of Semon's law, against which Grossmann contends, have been proven correct, and thus falls every objection to the theory which Semon deduced from these premises and which of itself is not the subject of attack.

V. THE OPENING OF THE GLOTTIS AND THE INNERVATION OF THE LARYNX DURING BREATHING.

Not only for Semon's law put also for two other, formerly much discussed, questions does the experimental removal of the posticus seem to us to be of a determining meaning: (1) For the question whether besides the postici there is still some laryngeal muscle able to exert an abductor influence, and (2) for the question concerning the innervation of the larynx during breathing. In an earlier work* we have already taken a position on these points, but inasmuch as this publication, is concerned with the discussion of an important, vital principle and is found in a work little accessible to the laryngologist, it is fitting here to briefly review the trend of our communication.

Our experiments showed that, even after the removal of the posticus, the rhythmic respiration movements still remained, and by correct measurement we obtained the proof that the vocal band deprived of its posticus in energetic breathing can be carried in inspiration so far outward that it is separated further from the median line than the other vocal band, whose superior and inferior laryngeal have been severed. The outward movements can be either active or passive. If they be of a passive nature, they must be referred to a relaxation of the adductors, which is present during expiration. In this case, however, the outward movement of the vocal band could not possibly exceed that position which corresponds to a complete relaxation of the abductors which is the position assumed by the vocal band after section of the superior and inferior laryngeal. But since exact measurements have repeatedly shown that the outward movement of the band deprived of its posticus exceeds that of the other side in an appreciable degree, there remains only one

*Kuttner and Katzenstein—Experimental contributions to the Physiology of the Larynx.; Arch. f. Anat. und Physiol.; Communication, 1889, p. 274.

possibility, that even after the removal of the posticus there is still present some force which may cause an active abduction of the vocal cords.

Further experiments have made it probable that the cricothyroideus, the arytenoideus and, especially, the cricoarytenoideus lateralis may cause an outward movement of the vocal band of the same side, questionably of the other.

In regard to point 2, concerning the innervation of the larynx during breathing, we have determined that the Krause-Semon theory, until now valid, that in quiet breathing only the abductors are tonically innervated while the adductors, on the contrary, are in perfect rest, does not obtain for the dog. The permanent rhythmic adduction and abduction movement, as shown in the quietly breathing dog, speaks with a certainty against the theory of a tonic innervation of the abductors. For the explanation of this laryngeal picture, only two possibilities come into consideration. Either there is an alternate innervation of the adductors and abductors or a rise and fall in the innervation of the abductors alone—a third is not possible.

The last mentioned possibility is excluded, however, by the condition of the dogs deprived of their postici. In these animals, after the operation, the vocal bands should maintain an equipoise if the adductors, during quiet breathing are not innervated and the abductors which alone should be innervated, have been removed; but this does not occur; more often there is found after the operation, exactly as before, even in quiet breathing a rhythmic adduction and abduction of both bands, only the range of movement is somewhat lessened.

If the postici were the only abductors, this fact would necessarily lead to the conclusion that the adductors as well as the abductors are innervated during quiet breathing. But—a fact overlooked by the adherents of the heretofore accepted belief—after the removal of the postici, other muscles have an abductive influence. This greatly complicates the above question, for it can be said that these muscles in taking up the function of the abductors also enter into their innervation. Yet, the proof can be shown that there cannot be simply a tonic or periodic

innervation of the remaining abductors, but *de facto*, an innervation of the adductors must accompany that of the abductors. The continuation of the adduction and abduction movements opposes the theory of tonic innervation of the abductors alone; while against a theory of a periodic rise of the innervation of the abductors with complete inactivity of the adductors we have the fact that by laying bare the larynx there is seen at every expiration both before and after the posticus removal a plainly active contraction of the cricothyroideus. The rhythmic contraction of this muscle synchronous with the adduction of the vocal band, which, appearing in the form of a movement of the vocal band, can, not alone, but only in conjunction with the other adductors, cause the movement in question, shows with certainty that the expiratory adduction in the dog is not of a passive nature but is brought about only by an active participation of the muscles concerned.

We consider it correct to transfer to mankind the physiologic principle obtained from the dog, and these are our reasons:

(1) It is of highly probability that the vital conditions in dog and men are not essentially different.

(2) Krause and Semon constructed on the ground of laryngeal pictures this conclusion as to what was the rule in men in quiet breathing, viz.: rest of the vocal bands in the abduction position.

We admit the abduction position without argument. But the motionless state of the vocal bands in this position is not entirely opposed to our statement, for it is just as clear by our explanation as by the Krause-Semon, and this single phenomenon is not a chief one, according to numerous statements of Semon himself. The majority of cases, in which, despite all precautions, the vocal bands do not stand still in quiet breathing,—and every one of these cases is a proof for us and against Krause-Semon,—is so great that it is wrong to proclaim the motionless position of the vocal bands during quiet breathing as the usual appearance.

But in this way the only basis on which the Krause-Semon theory was founded falls. And of just as little weight are the arguments which Semon urged against other possibilities which come chiefly into consideration here

are likewise of little weight. The following are Semon's arguments and our counter-arguments:

(1.) Semon, in contrast to O. Rosenbach, considers the totality of the adductors stronger than the abductors. If we took no position in opposition to Semon's argument he has gained nothing for his standpoint, for even the weakest muscle can do a markedly greater degree of work, as soon as its innervation is correspondingly increased.

(2) Semon insists, again in opposition to O. Rosenbach, that the adductors and abductors are as antagonistic to one another as the flexors and extensors of the extremities. In our opinion, this condition has no importance for the above question. Nevertheless the groups of muscles mentioned move the vocal bands in an opposing manner; whether or not there is as precise antagonism in the anatomic sense, seems to us immaterial.

(3) Semon claims that if the theory of the innervation of both groups of muscles is correct, there should be a widening of the vocal cleft on paralysis of the adductors. But as the widening does not appear in functional aphonia, where there is a paralysis of the adductors, he concludes that in quiet breathing the adductors are not innervated. We cannot accept this deduction, for the disease which affects the adductors in functional aphonia, affects only the voluntary vocalisers, while, as Semon himself explains, the possibility of a complete closing of the glottis on reflex stimulation is not vitiated. There is, then, no widening of the glottis in functional aphonia because no influence of the adductors is present in the respiration movements of the vocal cords, which indeed represent only a reflex action.

(4 and 5) Semon thinks that the greater vulnerability of the abductors and the central conditions of the innervation of both muscle groups speak against the physiologic preponderance of the adductors over the abductors. In our opinion, the physiologic preponderance of this or that group of muscles in the determination of this question comes as little into consideration as the anatomic, for not this but the momentary condition of innervation is that which gives the stronger force now to the abductors and now to the adductors.

(6) As his last and most potent argument against the

theory of the innervation of both groups of muscle, Semon says: "If the peripheral end of the severed recurrent is stimulated, the affected vocal band will be drawn towards the median line, i. e., the adductors are stronger than the abductors, although both groups of muscles were equally stimulated." These circumstances, which Semon considers, are not actually so. In breathing, the nerves which run to the adductors and to the abductors are not equally stimulated, but one stronger and the other weaker, and just from this alternation of force, from the alternating rise and fall of the stimulation, the different pictures which we observe in the larynx during the alternating phases of breathing result.

From all these observations we think the following conclusions may be drawn:

In men, as in dogs, both adductors and abductors are innervated during breathing (quiet as well as labored). During inspiration, the innervation energy of the abductors increases; during expiration that of the adductors. The movement, which is accomplished by the increase in the active force of a group of muscles is aided by the passive relaxation of the other group of muscles. All laryngeal pictures, which we observe in breathing from the inactivity of the vocal bands in the most quiet breathing, to the forcible, median position of the dead, rest on the same principle; the variability of laryngeal pictures is occasioned only by a variability of the energy with which one or the other group of muscles is brought into activity.

From the great number of our experiments, we give the following typical histories, which agree with the above in all essentials:

I. (Experiment 72). Black watch-dog, 7 k. g., about 6 months old; narcosis, morphine (subcutaneonsly), 0.075, ether.

Before the beginning of the operation, the glottis showed in quiet breathing, in very mild narcosis, a width of 10 mm. The vocal bands made a very small, short excursion, 1—1.5 mm. sideways.

The trachea was laid bare, and then cut across between the 4th and 5th cartilaginous ring. The upper end of the trachea and the larynx were separated from the esopha-

gus, and dissected upwards. The right recurrent was then cut, at once the right vocal band stood motionless in a sloping position with a free, sharp border, 1.6 mm. distant from the median line. The left vocal band meanwhile continued its rythmical movements of respiration; on expiration it came within 1 mm. of the median line, and on inspiration moved 4-5 mm. away from it. The left posticus was then removed; the rythmical respiration movements were still continued, but the vocal band, even on deep inspiration was not carried more than 2.8 mm. from the median line. The right superior laryngeal was then cut; the ligamentous portion of the vocal band moved 0.4 mm. outward, the arytenoid cartilage remaining in the same place. The glottis now showed, on deep inspiration, a width of 4.7 mm. The right vocal band, whose connection with both laryngeal nerves was destroyed, stood 1.9 mm. from the middle line, the left on deep inspiration was carried as far as 2.8 mm. outward, and exceeded the cadaver position of the other side by full 1 mm.

Prof. H. Munk was kind enough to confirm these results. The dog showed on the 5th day after the operation the same picture. The breathing, at rest, was not dyspneic, but became so on the least exertion. On the 7th day the dog became sick, and on the 10th he died.

Necropsy gave as cause of death a bilateral pneumonia; the left posticus was entirely removed.

II. (Experiment 84). Brown spitz, $\frac{7}{8}$ yr. old, weighed $7\frac{1}{2}$ kg; narcosis, morphine (subcutaneous), 0.12 g. ether.

Glottic width in quiet breathing 10 mm.; movement of vocal bands normal. The left superior and inferior laryngeal nerves were cut; the left vocal band became motionless in an inclined position, 2 mm. from the middle line.

The right posticus was laid bare from the side and removed. The rythmical respiration movements of this side continued but its abduction was clearly circumscribed. With quiet breathing, the right vocal band was carried, during expiration to 0.5 mm. from the median line; in inspiration it moved about 0.5 mm. outward, so that it reached quite, or nearly, the cadaveric position assumed by the other side, whereby the whole arytenoid was pushed like a coulisse from within outward. As soon as the breathing became easier, the right vocal band was plainly

drawn further outward, and indeed full ½ mm., so that the distance from the right vocal band to the median line was greater than that of the other side. It gave the impression as though a particular torsion or turn in the direction of the crico-arytenoid was added to the earlier bend toward the side.

Prof. H. Munk was kind enough to confirm these statements by observation made with the graduated magnifying telescope.

III. (Exper. 70). Black-draught dog, 10-12 years old, 20 kg. in wt.; narcosis, morphine (subcutaneously), 0,12 ether.

The glottis showed at the beginning of narcosis a width of 12-14 mm. in quiet breathing; the vocal bands moved normally.

The trachea was laid bare, cut across, and dissected up. Thereupon the glottis showed, on quiet breathing, a width (inspiration) of 4-4.5 mm. On deep inspiration it increased in width to 5 mm. On every expiratory adduction, even with an entirely quiet breathing, a plain contraction of both crico-thyroidei was visible. The trachea which had been severed and dissected upward acted like a writing lever, showing every contraction by a movement upward. The dog was quite alert, and made efforts to break away from his fetters. Both ends of the trachea were approximated and the wound closed, but the laryngeal picture remained unaltered.

Eight hours later, the dog was still drowsy, but somewhat more lively and came when called into the room, etc. When quiet, the respiration was noiseless, 24 times a minute, becoming, on movement, quickly dyspneic and vehement. The dog was now tied down and slightly etherized. Breathing was quiet; glottic width 4.5 mm. The vocal bands showed only a small respiratory oscillation; the adduction movement appeared fairly energetic, slightly oscillating; the abduction movement appeared somewhat painful in 2 to 3 phases, giving the appearance as though the muscle, required for this work, was too weak for its task. In order to test whether the method of operating by making an entrance from the side to the postici had an influence on the movement of the vocal bands, the pharyngeal constrictors and fascia, on

both sides, were cut through, so that the posterior face of the cartilaginous ring which had been deprived of its posticus was laid bare. The movements of the vocal bands and the glottic width remained unchanged.

The superior and inferior laryngeal on both sides were then encircled by loops; all four nerves show a typical muscle reaction with the faradic current (200 mm. distant). When all four nerves were cut, the glottis showed a width of 4 mm., i. e. it is 5 mm. narrower than the inspiration position in rapid breathing after removal of both postici. The dog was killed by a stab in the heart. The section showed that both postici with their respective nerves had been removed and, further, both superior and inferior were cut.

IV. (Experiment 81). Black watch dog, about 2 years old, 9 kg. in weight; narcosis, morphine (subcutaneously), 0.15. ether.

Glottic width with quiet breathing 12 mm. Movements of bands normal. Both superior laryngeal were laid bare and tied; then, from the side the right posticus was laid bare and removed. Thereupon the glottis, in quiet breathing, showed a width on inspiration of 6.3 mm.; the distance of the right band from the median line amounting to 2.2 mm., and that of the left to 4.1 mm. Section of both superior laryngeal nerves made the bands somewhat looser, but produced no change in the movements. The left recurrent was then cut; at once the left vocal band stood still (1.8 mm. from the median line) the right was abducted as before, 2.2 mm. so that at the moment of inspiration the glottis width was 4 mm. Now the crico-arytenoideus lateralis dexter was severed; at once the glottis was narrowed to 3.2 mm.; both bands were now approximately symmetrical. The rythmical movements of the right vocal band had become minimal; the difference amounted to about 0.5 mm. On stimulating the right recurrent, the vocal band of the same side pressed close on to the median line.

The dog was killed by a stab in the heart. On section, it was seen that the right posticus had been entirely removed, and the right lateralis had been cut through to a small fibre. Both superior laryngeal and the left recurrent had been cut.

V. (Experiment 92). Black poodle, about 10 years old, 22 kg. weight; narcosis, morphine (subcutaneously) 0.1. ether.

Glottic width, 8 mm. Movement of the vocal bands normal. Both recurrents were laid bare and encircled by a loop of thread; stimulation with the faradic current gives a typical reaction. The thread around the right recurrent was tied, the movement of affected vocal band became trembling and showed a decreased abduction. At the moment the knot touched the nerve without compressing it tightly, the right band approached close to the median line and stood still. The left recurrent was then severed by a sharp scissors, at once the left vocal band stood in a curved position, at the back 5.5 mm. from the right band. The glottis gave the appearance of a right-angle triangle, the right angle being adjacent to the right vocal band. When the right recurrent was stimulated distal from the knot or immediately behind this, a typical twitching of the vocal band occurred. When the electrode was placed 1-2 cm. to the central side of the knot, no reaction followed. About 30 minutes after the tying of the thread, the glottis again presented about the appearance of an isosceles triangle; the right vocal band also shows a curved position, corresponding to that of the left.

VI. (Experiment 71). Black watch dog 6 or 7 years old, 15 kg. weight; narcosis, morphine (subcuteneously) 0.1. ether.

Glottic width, 10 mm. Movement of vocal bands normal. Even in entirely normal breathing, at every inspiration a plain contraction of the crico-arytenoidei was visible.

Trachea cut through 1-2 cm. below the larynx. The upper end and the larynx were separated from the esophagus, and dissected upwards. Both postici were removed. Then the trachea was sutured together, The respiration movements were continued, the greatest glottic width measured being 4.5 mm. Thirty-eight days later, dog well, ate well. When quiet, breathing inaudible; under examination dyspnea quickly appears. The vocal bands move symmetrically and synchronously, and the greatest glottic width was 4.5 mm. Section shows that both postici had been completely removed.

ABSTRACTS FROM CURRENT OTOLOGICAL, RHINOLOGICAL AND LARYNGOLOGICAL LITERATURE.

I.—EAR.

A Contribution to Diplacusis.

TEICHMANN, Berlin. (*Archives of Otology*, Vol. XXVIII, No. 1.) By diplacusis we understand a functional alteration in which an objective tone is heard double. The author in making tuning fork tests discovered that when the fork c^4 is dying away before his ears, a few seconds before it ceases vibrating, he heard a second tone, a minor third below. This minor third is less intense than the original, begins suddenly with a delicate buzzing and dies away gradually with the original note. The author agrees with Gradenigo, that diplacusis is an abnormal increase of physiological processes (transmissions of excitations, etc.,) and originating in the labyrinth and nerve centers. He learned, however, that diplacusis may depend on peripheral causes. Through exposure he felt a slight coldness in his right ear accompanied by ringing and roaring. There was moderate deafness, perception was reduced for c^1 and c^2 forks. Next day the tinnitus was less apparent, the c^2 fork sounding dull, but with a distinct overtone of f^2. Improvement came slowly, even after several days the fork c^2 was accompanied with a double tone on e^2 in the right ear, as the ground tone died away. A purely labyrinthine affection was excluded by normal perception of the c^2 fork by bone-conduction, false hearing by aerial conduction and alterations in perception after the air bag. So we are left to assume a combination of middle ear and labyrinthine disease. *Campbell.*

Movable Spongy Osteoma of the Cartilaginous Portion of the External Auditory Meatus.

EULENSTEIN, Frankfort-On-The-Main. (*Archives of Otology*, Vol. XXVIII, No. 1). The patient, a man, aged

36, complained of deafness, of one week's standing, in the right ear. Tuning fork test showed deafness by aerial conduction. The meatus was reduced to a mere slit owing to the presence of a tumor covered with normal epidermis. The contracted orifice was full of cerumen. After removal of the cerumen, by syringing, the hearing became nearly normal.

The tumor was movable with a rotary motion and the probe could be passed around it. With a snare the tumor was readily removed and its attachment was seen in the cartilaginous portion of the meatus. Macroscopically the mass, the size of a large pea, resembled medullated bone. Microscopically, it was diagnosticated as a typical exostosis with mucous medulla. The osseous trabeculae contained numerous osteoblasts. There was no actual pedicle, its locality being suggested by a spot without epithelium. *Campbell.*

Remarks on Mastoid Operations, with a Case of Bezold's Mastoiditis.

GRUENING. (*Archives of Otology*, Vol. XXVIII, No. 1.) The operation, which the author practices, is essentially that of Schwartz. It consists of the systematic removal of the external wall of the mastoid process, from the apex to the linea temporalis. Beginning below, he exposes the terminal pneumatic spaces, removes pus, granulations and diseased bone and converts the cells into one spacious cavity. The relation of the sigmoid sinus to the antrum is determined, and the antrum generally reached without difficulty.

The case reported is that of a man who suffered from pain in the right ear, and on whom an aurist did a paracentesis. The pain subsided and the ear began to discharge. In about two weeks the patient considered his ear trouble at an end. A few weeks later, he had violent chills, his right cheek and retro-maxillary region were swollen, and the tip of the mastoid and an extensive post-mastoid area were tender. The mt. was intact and with the right ear he could hear a watch at a distance of 3 inches.

On the mastoid being exposed, the cortex appeared sound, but when the tendon of the sterno-cleido-mastoid muscle was detached, a large quantity of pus welled up. Upon

close inspection it was found that the pus occupied the diagnostic fossa, had burrowed under the parotid gland and also formed an abscess in the substance of the sterno-cleido-mastoid muscle.

No pus was found in the antrum, but its posterior wall showed a perforation, which led into the groove of the sigmoid sinus, where a large collection of pus surrounded the vessel. In the tip of the mastoid and in the posterior wall of the apex cell perforations could be traced, which must have communicated with the substance of the sterno-cleido-mastoid muscle and the digastric fossa respectively. *Campbell.*

A Case of Acute Mastoiditis (Bezold Variety) without Perforation of the Drum Membrane; Operation; Recovery.

KNAPP, ARNOLD H. (*Archives of Otology*, Vol. XXVIII, No. 1.) A man, aged 21, applied for treatment because of loss of hearing and tinnitus in the left ear. After measles the hearing in the right ear was permanently impaired, although there never had been any otorrhea. The present illness came on one week ago after a cold.

ON EXAMINATION:—Left ear: Conversational voice, $\frac{8}{60}$; Rinne, negative; the mt. is intact, of normal color and retracted; inflation, improved hearing; mastoid region, normal.

Right ear: Voice, $\frac{2}{60}$; no high tones; Rinne, negative; the mt. retracted and atrophic; no improvement in hearing after inflation.

The patient visited the clinic at intervals for six weeks. The hearing in the left ear, though at first improved by inflation, grew gradually worse. Suddenly severe pain in the ear, with mastoid redness and swelling, set in. Temperature, 101° F. mt. appearance unchanged. Paracentesis was followed by the escape of a small quantity of blood serum only.

The mastoid was opened and its cells found converted into one large cavity filled with pus, carious bone and granulations. A probe was passed through an opening beneath and in front of the antrum, which led into a cavity covered externally by the mastoid tip and the sterno-cleido-mastoid muscle. The tip and the entire inner wall of the mastoid were removed and the digastric fossa and styloid process exposed.

Recovery was uneventful. The hearing in the left ear quickly returned. Whisper, $\frac{1}{20}$. Rinne, positive. The mt. was thickened and depressed. *Campbell.*

A Plea for the More Accurate Definition of Tuning-Forks.

GREEN, J. ORNE. (*Archives of Otology*, Vol. XXVIII, No. 1.) The author refers to the difficulties encountered in comparing tuning-fork tests of different observers on account of the different systems of notation used in different countries.

In France the semivibration (vibration single, or v. s.) is used; while in Germany, England and America the full vibration (vibration double, or v. d.) is used.

In the interest of both authors and readers it is suggested that any note to which reference is made should be described in full, giving the number of vibrations and whether they are double or single; for example, fork 512 v. d., or C 1024 v. s., or F 682.4 v. d. *Campbell.*

Dry Air in the Treatment of Suppuration of the Middle Ear.

ANDREWS, New York. (*Archives of Otology*, Vol. XXVIII, No. 1.) Knowing that dry air is unfavorable to the growth of bacteria, the author has successfully applied this treatment to the middle ear suppurations. He has modified his powder blowers by adding a wooden or glass handle, so that it can be held by the operator while heat is being applied to the metallic cylinder. *Campbell.*

Otitis Media Purulenta; Cleansing the Ear Therein.

JACKSON, CHEVALIER. (*Journ. Amer. Med. Assn.*, Jan. 28, 1899.) In addition to the usual method of thoroughly cleansing and sterilizing the infected field, the author advises the use of a solution of carica papaya for cleansing purposes on account of its digestive properties, and in his hands it has proved more valuable than any other preparation for this purpose. *Scheppegrell*

Suppuration of the Middle Ear, Complications and Consequences, with Report of Illustrative Cases.

MCCONACHIE, A. D. (*Maryland Med. Journal*, Jan. 28, 1899.) Drugs dropped into the ear for relief of pain should be dissolved in oil rather than in water. A five to 10 per cent. solution of cocain in lanolin is preferred.

Scheppegrell.

The Grippe Ear.

EWING, F. C. (*Tri-State Med. Journ.*, Jan., 1899.) A characteristic of the grippe ear is persistent pain after rupture of the tympanic membrane. It is not less likely, however, with suitable treatment to end in a perfect cure. The treatment does not differ from that of simple inflammatory affections. *Scheppegrell.*

Hypertrophic Catarrh of the Middle Ear.

LAFORCE, B. D. (*Journ. Amer. Med. Assn.*, Feb. 25, 1899.) In many cases, the cure of the nasopharyngeal catarrh, associated with the majority of these cases, will prevent recurrence of the disease in the tympanum. In addition to local treatment, the hygienic and sanitary surroundings should be carefully looked after.

Scheppegrell.

Progress in Otology.

HARDIE, T. MELVILLE. (*Journ. Amer. Med. Assn.*, June 3, 1899. An interesting review of the progress made in otology, with a careful bibliography of the subject.

Scheppergrell.

Earache in Children.

GLEASON, E. B. (*Medical Council*, Jan., 1899.) In many cases, gentle inflation of the middle ear is more efficacious for earache than either heat or cocain. Instead of the Politzer bag, the author prefers for this purpose two feet of rubber tubing provided with end-pieces of glass or other material, one for insertion into the patient's nostril and the other to be placed in the operator's mouth. The child is asked to puff out his cheeks, when the operator blows gently into the tube, and, the nostril being otherwise closed, the air enters both middle ears. Extreme gentleness should be used in this method.

As a prophylatic of earache, the child should be taught to blow the nose properly. The best method is by means of the Politzer bag, which is inserted in one nostril and the secretion blown from the other, this procedure being practiced two or three times daily. Local abnormalities should be corrected, and attention paid to the genera health of the patient. *Scheppegrell.*

A Case of Phlebitis and Thrombosis of the Sigmoid Sinus and the Jugular Vein of Aural Origin.

KOLLER, CARL. *(Medical Record*, Feb. 11, 1899.) The patient, a girl of 13 years, had a septic appearance, was conscious but very hard of hearing. Soon after admission to the hospital she had a chill of five minutes duration, temperature 104 F. This was soon followed by another chill and a temperature of 106 degrees, the symptoms becoming worse.

The patient had had scarlet fever when three years of age and since then had repeated suppuration from the ear. A careful examination showed a thrombo-phlebitis of the right sigmoid sinus and jugular vein. Surgical interference was decided upon. The usual operation was made, the patient, however, being already unconscious before the anesthesia was commenced. The thrombosed vein was incised and a sharp spoon passed up toward the bulb. The thrombus was found to be half solid. Incision was then made into the sinus and several drams of foul smelling pus evacuated. Immediately after the operation the patient looked cyanotic, but soon reacted. The next day pain developed in the chest and crepitant rales over the left lung. Respiration became shallow and finally ceased entirely. No autopsy was allowed.

Scheppegrell.

Ear Diseases Co-existent with Adenoids of the Nasopharynx; an Analysis of 110 Cases.

BRAISLIN, W. C. *(Phil. Med. Journal*, Feb. 25, 1899.) A great many of the ear diseases of childhood depend for their etiology upon adenoids of the nasopharynx, The demonstration of the presence of adenoids should in every case lead to investigation of the state of the ear. Ear diseases in some degree, will almost invariably be found to accompany the adenoid growth. The treatment of ear diseases should always be continued for a variable time after the removal of the adenoids. Removal of the growth checks, to a great extent, the onward progress of the ear disease, but the operation does not eliminate the requirement for subsequent treatment of the ears in suppuration, tubal obstruction or other well established pathologic conditions. The presence of adenoids has a continuing de-

generating influence on the ears, while under the influence of colds or attacks of acute contagious disease of childhood, adenoids are prone to produce active disorders.

Scheppegrell.

Diagnosis and Treatment of Suppuration of the Middle Ear.

TOEPLITZ, MAX. (*Medical Record*, December 31, 1899.) A review of the diagnosis and various forms of treatment of suppuration of the middle ear, commencing with simple cases, in which mild irrigations are recommended, to the most severe forms in which Stacke's operation and its various modifications are recommended. With the aid of these methods under favorable conditions, aural suppuration may be cured. *Scheppegrell.*

Electricity in Deafness and Strictures of the Eustachian Tube.

NEWMAN, R. (*Medical Record*, Dec. 17, 1898.) The method advocated is that described by Dr. A. B. Duel, in which small copper bougies varying from numbers three to six (French scale) mounted on No. 5 piano wire passed through insulated catheteters into the Eustachian tube, the bougies being connected with the negative pole of a battery, and the circuit completed by the patient holding the positive pole. Two of five milliamperes are applied.

In the cases reported it is demonstrated that electrolysis is useful in cases of deafness due to stricture of the Eustachian tube. *Scheppegrell.*

The Use of Nosophen and Antinosin in Purulent Disease of the Ear.

MILLENER, F. H. (*Buffalo Med. Journal*, Dec., 1898.) In purulent suppurative otitis media, the antinosin solution, two and a half to three per cent., is allowed to remain in the ear for five minutes. Nosophen is then applied by means of a powder blower. In the cases reported by the author, this treatment gave good results. *Scheppegrell.*

A Case of Acute Mastoiditis; Perforation of the Medial Plate of the Process and Consecutive Abscess of the Neck.

BURNETT, CHAS. H. (*University Med. Magazine*, Feb., 1899.) Three ways of propagation of otitic and mastoid suppuration of the neck are recognized, viz., by way of the veins, of the lymphatics, and by direct escape of the pus through a spontaneous opening in the medial plate of

the mastoid process, beneath the insertion of the sterno-mastoid muscle, the latter being known as Bezold's mastoiditis.

In a case reported, there was a copious discharge from the right ear. The mastoid region behind the auricle appeared perfectly normal, but behind and in front of the insertion of the sterno-mastoid muscle there was a swelling extending downward about three inches, most prominent however behind the sterno-mastoid muscle and toward the nucha. The appearance of this swelling was coincident with the cessation of the mastoid pain. Firm pressure on this swelling forced pus from the middle ear through the perforated membrana tympani.

An incision two inches long and three deep was made into the abscess and a fluid dram of odorless pus escaped. A grooved director was passed down to the bone, which entered an opening apparently in the base of the mastoid process and passed with little pressure into the cells. Sterilized water syringed into the incision passed directly into the middle ear and out of the external auditory meatus. The case healed without further operation on the mastoid.

The author calls attention to the efficacy of this treatment, and concludes with some excellent advice on the treatment of acute otitis media and consecutive mastoiditis.

Scheppegrell.

II.—NOSE AND NASO-PHARYNX.

On Congenital Closure of the Choanae.

JOEL, Gotha. (*Archives of Otology*, Vol. XXVIII, No. 1.) The author describes these closures as unilateral or bilaterial, complete or incomplete, bony or cuticular. He then relates the history of a case, in which he entitles the obstruction unilateral, complete and mixed. *Campbell.*

The Toilet of the Nose.

RICHARDS, G. L. (*Medical Progress*, Feb., 1899.) To prevent the development of catarrhal conditions of the nose, the author believes that we should pay the same attention to the toilet of the nose that we do to that of the

teeth, and that the nostrils should be washed as frequently as the teeth. *Scheppegrell.*

A New Method for the Operative Correction of Exaggerated Roman Nose.

GOODALE, J. L. (*Bost. Med. and Surg. Journal*, Feb. 2, 1899.) After the patient, a girl of 13 years, had been etherized and placed in the Rose position, a pair of short curved scissors with the convexity uppermost was introduced into the left nasal vestibule. One blade was made to penetrate the triangular cartilage at its anterior extremity immediately beneath the integument, and a cut made along the superior margin of both cartilaginous and bony septum, terminating at the junction of the perpendicular plate of the ethmoid with the cribriform plate. The superior margin of the septum was thus separated from the integument and from the nasal bones by this incision, the outline of which was essentially parallel with the angular outline of the bridge of the nose. The extremities of this angular incision were next connected by a straight cut made through the septum with straight scissors, and the portion of the septum included between the two incisions was removed with forceps. A septum with a straight superior outline was thus produced.

The next step consisted in depressing the bony bridge of the nose so that it should rest upon the now straight septum. A small nasal saw was introduced with the teeth uppermost into the left nasal passage and the articulation of the nasal and maxillary bones sawn through from below upward, this procedure being repeated on the right side. A few comparatively gentle taps upon the nasal bones sufficed to break the frontal articulation and depress them, still firmly united with each other, until they came into contact with the upper margin of the septum. With the depression of the nasal bones, the bridge of the nose assumed a straight line from tip to forehead, but a ridge at the same time appeared on either side, formed by the maxillary bone along the line of the nasal articulation. This was corrected by two or three light blows, with a protected mallet, upon this ridge fracturing the maxillary bone which is here very thin.

The operation occupied about 40 minutes and was

attended by comparative slight hemorrhage. An external splint was applied to hold the nasal bones and fragments of maxillary bone in proper position. The result was satisfactory. *Scheppegrell.*

Some Remarks Upon the Use Suprarenal Gland of the Sheep in Nasal Surgery.

VANSANT, E. L. (*Phil. Med. Journal*, Feb. 25, 1899.) After a preliminary cleansing, the parts to be operated upon are painted with a five per cent. solution of cocain. Five to 10 minutes later the prepared solution of suprarenal gland is thoroughly applied by means of cotton wool. Both the anesthetic and ischemic effects of the cocain are increased and prolonged. In acute and subacute inflammatory conditions of the nasal chambers, such as coryza, hay fever, etc,, this method gives much greater and more prolonged relief from the congestion than when cocain alone is used.

The solution is prepared by adding the contents of one capsule of dessicated extract to one-half ounce of camphorated and distilled water, to which 11 grains of boracic acid have been added. *Scheppegrell.*

Sarcoma of the Nose.

EVANS, THOS. C. (*Medical Times*, Feb., 1899.) A post mortem examination of a man of 54 years, who died from sarcoma of the nose, showed complete absorption of the basilar process of the occipital bone as well as the body of the sphenoid. It has also grown into the middle fossa of the scull, the tumor in this region being about the size of a partridge egg, and also into the orbit, causing exophthalmos which destroyed the eye.

Scheppegrell.

Indications for Operation in Adenoid Disease of the Nasopharynx.

BALL, J. G. (*Clinical Journal*, Dec. 28, 1898.) Among the indications enumerated are habitual mouth-breathing or labored nasal breathing or suffocative attacks at night. If ear symptoms, or bronchitis develop, or reflex disturbances such as nocturnal enuresis, chorea, etc., the author also recommends operation. *Scheppegrell.*

The Etiology and Diagnosis of Empyema of the Accessory Sinuses of the Nose.

SCHADLE, J. E. (*St. Paul Med. Journal*, Jan., 1899.) A review of the etiology and diagnosis of empyema of the accessory sinuses of the nose illustrated by eight excellent half-tone cuts of preparations from the author's collection.

Scheppegrell.

Chronic Perichondritis of the Nasal Septum.

SOMMERS, L. S. (*Medical Record*, Jan. 14, 1899.) Localized perichondritis forming spurs on the nasal septum is a frequent occurrence, while general inflammatory thickening of the soft tissues and cartilages occurs in but a small proportion of nasal diseases. In the development of these cases there is first congestion, increased glandular activity and diltated blood vessels, followed by hyperplasia with increase in the number of cells.

Falls and blows on the nose are most common causes, although indirect traumatism as when due to deflected air-currents is responsible for a certain number of cases.

Scheppegrell.

Occlusion of the Posterior Nares; with Report of Two Cases.

FRITTS, J. R. (*Medical Times*, Feb., 1899.) A girl of 10 years, while being treated for a polypus of each naris, was found to have complete occlusion of the posterior nares, the palatal bone passing upward and backward, attaching to the sphenoid and forming a union between the center and the vomer, which caused a large ridge or thickened center of the abnormal bony part closing the posterior nares. The sense of smell was absent but the hearing was excellent. An opening was made by means of a dental burr, and was kept pervious by a hard rubber catheter.

The second case was that of a man 24 years, in which the obstruction was similar. The author collates 17 other cases which he has succeeded in finding in medical literature, making a total of 19 cases on record.

[The author has omitted a case, reported by Dr. W. Scheppegrell, of congenital occlusicn of the posterior nares, published in the *Annals of Ophthalmology and Otology*, Apr., 1894. The reporter has also operated on another case of congenital occlusion which has not yet been published.] *Scheppegrell.*

III.—MOUTH AND PHARYNX.

Foreign Bodies in the Pharynx and Esophagus.

JONES, R., in a paper (*Lancet*, May 6) describes his experiences with foreign bodies in the pharynx and esophagus. Often, a small body may set up alarming symptoms. He has removed fish bones, orange peel, pins, apple, match, date-stone, plum-stone, camel's hair brush, slate pencil, set of false teeth, coins, etc. He advocates prompt energetic treatment; first explore, after anesthetizing locally the sulci between the fauces and the tonsil. Then examine with the laryngoscope. Examination with the head lowermost is favorable to coughing up the body and there is not so much danger of dislodging the particle into the larynx or trachea. Extract by means of the double coin-catcher or the sponge probang. Do not push rough, angular bodies into the stomach. Perform laryngotomy or tracheotomy if there is great obstruction to the breathing. Esophagotomy or gastrotomy is the last resort, the latter if the body is more than 30 centimeters from the teeth. As practical rules he gives (1) bodies which have remained some time and given rise to symptoms of obstruction, irritation or dyspnœa should be operated upon at once. (2) Forcible attempts at extraction *per os* are to be condemned. (3) Sharp, irregular impacted bodies especially require esophagotomy. (4) Sometimes gastrotomy, and sometimes a combination of gastrotomy and esophagotomy is required. (5) No stitches should be used where the wound in the esophagus is jagged, or its walls inflamed. (6) Otherwise stitch with continuous suture, not piercing mucous coat. (7) Only when no danger of infection or suppuration exist, should the external wound be closed. (8) Liquid food may be given *per os* in 24 hours after the operation. *Loeb.*

Acute Diffuse Cellulitis of the Sub-Maxillary Region.

WEBBER, H. W. (*Lancet*, Sept. 17, 1898.) CASE I. Woman, aet 43, was admitted, suffering from inflammatory swelling of the neck with dyspnea. When observed by the writer she was moribund from asphyxia. A deep incision was at once made from the chin to the sternum and the trachea, which was five inches from the skin

surface, was opened and a sinus forceps inserted. A tracheotomy tube not being at hand a Symonds' esophageal tube was inserted and the cavity around this was powdered with iodoform and tightly packed with strips of sal alembroth gauze to avert if possible the entrance of septic material into the trachea. On the next day a dozen free incisions were made into the neck and drainage tubes inserted into two of them. Patient recovered.

CASE II. Woman, aet 20, was found sitting up in bed, face of a dusky purplish, pulse 120, temperature 102°, with a brawny inflammatory swelling extending from the lobule of the right ear to the hyoid bone, chin and lower jaw. The floor of the mouth was involved, dyspnœa was present, and speech impossible. Deep incisions were made and tracheotomy later performed. Patient died.

Loeb.

Leucoplakia.

MARSHALL, J. H. (*Journ. Amer. Med. Assn.*, Feb. 25, 1899.) An interesting description of the varieties, etiology, predisposing causes, symptoms, diagnosis, prognosis and local and surgical treatment of this affection.

Scheppegrell.

Pseudo-Membranous Angina Due to the Pneumococococcus.

VIDEL, A. AND V. (*Medical Record*, Dec. 31, 1898. *Bull. Med.*, No. 64, 1898.) A report of five cases of severe angina in children due to the pneumococococcus. In three cases the erythematous type existed, the children recovering in from seven to eight days. The other two cases were of the pseudomembranous type, the children from the outset giving evidence of severe infection. All therapeutic efforts were without effect. The injection of diptheria antitoxin produced no result and the children died.

Scheppegrell.

A Contribution to the Pathologic Histology of Acute Tonsillitis.

GOODALE, J. L. (*Bost. Med. and Surg. Journal*, Jan., 1899.) The article embodies the result of the histologic examination of 16 cases of acute tonsillitis, illustrated by three excellent plates. Two distinct types of histologic lesions were encountered. In all cases a diffuse prolifer-

ation of the lymphoid and tissue cells was present. Four cases showed also local foci of suppuration in the follicles. Acute tonsillitis due to infection by the streptococcus pyogenes and the staphylococcus pyogenes albus and aureus is characterized histiologically by a diffused inflammation of the parenchyma of the organ, appearing in the form of an increased proliferation of the lymphoid cells and of the endothelial cells of the reticulum, due probably to the absorption of a toxin formed in the crypts. While bacteria are rarely demonstrable in the tonsillar tissue in cases characterized by purely proliferative lesions, yet at times infection of the interior of the follicle occurs, giving rise to circumscribed suppuration and the formation of abscesses which eventually discharge into the crypts.

Scheppegrell.

IV.—LARYNX.

Eversion of the Ventricle of the Larynx and Cyst Involving the Larynx and Side of the Neck.

INGALS, E. F. (*Journal Amer. Med. Assn.*, Feb. 18, 1899.) A man of 39 years suffered from difficulty in speaking. A cystic tumor about one and a half inches in diameter was located just below the angle of the jaw upon the right side. By pressure, it could be almost disseminated, but it immediately returned when the pressure was removed, and when pressure was made the patient was unable to speak.

Examination showed a bulging of the right side of the base of the tongue crowding somewhat against the epiglottis. The swelling was about five-eighths of an inch in diameter, having a cystic appearance. It extended downward, at the right side of the larynx crowding the epiglottis inward and causing a bulging of the ventricular band so as completely to hide the right vocal cord and ventricle upon inspiration, and the left cord and a part of the left side of the larynx on attempted phonation. An exploratory syringe demonstrated the cystic character of the tumor.

About two ounces of a mucilagenous semi-transparent fluid was removed from the cyst by means of an aspirating needle. Three-fourths of a dram of equal parts of carbolic acid and glycerin were injected by the same needle

and allowed to remain in contact for several minutes. Upon examination of the larynx it was found that the cystic tumor at the base of the tongue and at the side of the larynx had disappeared. There was a smooth reddish tumor about five-eighths of an inch in length and three-eighths in diameter projecting from the right side of the larynx just above the vocal cord, which was demonstrated to be a prolapsed ventricle.

Fearing acute swelling, a number of incisions were made into the mucous membrane with forceps. The everted ventricle was removed by means of the polypus snare. Some days later, the voice was still hoarse in consequence of the thickening of the vocal cords, but otherwise the patient appeared well. *Scheppegrell.*

V—DIPHTHERIA.

Membranous Croup.

SAWYER, J. L. *(Iowa Med. Journal*, Vol. IV, No. 8.) Membranous croup is contagious and identical with diphtheria. Antitoxin has a very favorable influence, proving almost a specific, and combined with intubation, the mortality is very small. Peroxide of hydrogen does not influence the diphtheritic poison, but it prevents mixed infection. A powder containing iodoform and sulphur has proved a useful local remedy. *Scheppegrell.*.

Remarks on Antitoxin, Diphtheria, the Practitioner and History.

A Practical View of Antitoxin and Diphtheria in Private Practice.

Antitoxin, Diphtheria and Statistics.

RUPP, DR. ADOLPH. *(Medical Record*, Nov. 5, 1898; Dec. 31, 1898; Jan. 28, 1899.) Although many able practitioners and scientists claim that antitoxin for diphtheria has ceased to be a question, and that all argument concerning the fact of its utility is futile labor, other equally able observers and equally well equipped practitioners claim that the remedy is useless and at times harmful.

From a careful analysis of 24 cases treated, the author concludes that the remedy has no well marked favorable

effect on the general and clinical course of the disease; it neither shortens nor lessens its severity. In the croupous cases it exerts no beneficial or inhibitory influence on the progress of the croup. The operation in these cases and not the antitoxin saved the children. In none of the 24 cases, nor in others seen by the author, did the antitoxin seem (beyond a reasonable doubt) to cause the pseudomembranes in the throat to disappear sooner than would have been the case had no antitoxin been used.

In all his cases, the initial dose of antitoxin was given not earlier than the third day, and not later than the fourth. None of the cases were markedly "septic" or "mixed," nor were they severe cases in any sense.

Antitoxin is a substance and a remedy of a variable and irregular unit strength. The same make of antitoxin may be highly praised at one place and condemned at another on account of its high mortality. It is an organic substance which is easily impaired by age and unfavorable temperatures. It has no power to check or to mitigate diphtheritic laryngeal processes. The differences in mortality rates vary as much in different places and at different times among antitoxin cases as they do among cases that have not been antitoxinized. *Scheppegrell.*

The Health Department and Diphtheria.

JONES, C. H. (*Maryland Medical Journal*, Jan. 28, 1899.) A report of the work of the health department of Baltimore against diphtheria during the last six months of 1898. Instead of using yellow flags, yellow cards were substituted which gave good results. The rule established in 1897 that children from an infected house should not attend school until the house had been thoroughly disinfected and until after all the throats of the children had been examined was enforced. Antitoxin is strongly advocated as a curative as well as a preventive agent.

Scheppegrell.

The Death Rate of Diphtheria in the Large Cities of the United States.

JORDAN, J. E. (*Phil. Med. Journal*, Feb., 1899.) The following table shows the decrease in the average death-rate from diphtheria since the introduction of antitoxin:

City.	Average death-rate from diphtheria and croup, per 10,000 population, 1886-1894.	Average death-rate from diphtheria and croup per 10,000 population, 1895-1897.
266 German towns	10.6	4.4
Berlin	9.3	4.0
Paris	6.1	1.5 (2.1)*
London	6.0	5.8
New York	15.1	8.0† (7.1)‡
Chicago	12.0	6.4† (5.2)‡
Brooklyn	14.7	10.1† (8.8)‡
Philadelphia	10.1	11.0† (10.7)‡
St. Louis	11.7	7.5
Boston	11.8	10.9
Baltimore	7.0	6.2
Milwaukee	13.5	7.3

This table shows considerable divergence during the antitoxin period as well as during the pre-antitoxin period. The lowest rate for the pre-antitoxin period was in London, 6.0, the highest in New York, 15.1; the lowest for the antitoxin period was in Paris, 1.5, the highest in Philadelphia, 11.0. The greatest actual diminution occurred in New York, the largest percentage decrease in Paris.

In explanation of the fact that the decrease in London has been very small, Dr. Corbett has suggested that "there was more room for improvement on the Continent than in London," and that "the prevailing type of diphtheria during the past three years has been very severe in London." That the results have been better than those obtained in the United States he claims to be due to the fact that the serum used in this country is inferior to that used abroad, and that the remedy is more extensively used there than here. *Scheppegrell.*

The Management of Diphtheria from a Public-Health Standpoint.

STOKES, W. R. (*Maryland Med. Journal*, Jan. 28, 1898.) For disinfection, formaldehyd gas has been used, but the tests have not yet been completed. Anti-

*1894-1897. †1895-1898. ‡1896 1898.

toxin in the treatment of diphtheria gave gratifying results. Isolation hospitals for treatment is recommended.

Scheppegrell.

The Use of Antitoxin in the Treatment of Diphtheria.

WILLIAMS, J. J. (*Medical Review*, Feb., 1899.) A detailed report of 14 cases of diphtheria treated with antitoxin, the result being favorable in all the cases except the first in which infection had progressed too far.

The author states that the accepted idea of the maximun period of incubation being 72 hours is erroneous, as his experience warrants the belief that the germ of the disease may be deposited in the fauces and there retained for a much longer period. *Scheppegrell.*

MISCELLANEOUS.

Arrest of Hiccough by Depressing the Tongue.

KOLIPINSKI, L. (*Maryland Med. Journal*, Feb. 25, 1899.) In a case of singultus, in which the symptoms had continued until they were alarming, complete relief was afforded by firm pressure on the tongue by means of a large spoon handle. *Scheppegrell.*

Surgical Treatment of Exophthalmic Goitre.

SCHWARTZ, M. (*Medical Times*, Feb., 1899.) In a case of marked symptoms, a resection of the right sympathetic and two-thirds of the superior cervical ganglion was made, and at the same time that of the left sympathetic involving also a section of the spinal. The operation was followed by marked amelioration of the symptoms observed.

Scheppegrell.

Pulmonory and Laryngeal Tuberculosis Treated with Antiphthisic Serum T. R., with Remarks on the Etiology of Tuberculosis.

FREUDENTHAL, W. (*Medical News*, Feb. 18, 1899.) The antiphthisic serum was used in four cases. Although the results were not as gratifying as those obtained by Drs. Carl Fisch, A. M. Holmes and F. B. Waxham, they were sufficiently good to encourage the author to continue his investigations. *Scheppegrell.*

Removal of Foreign Bodies from the Respiratory Tract.

TAULBEE, J. B. *(Medical Progress*, Feb., 1899.) The foreign body was the escutcheon of a keyhole of a chest, measuring one-half by one and a half inches, which had been retained in the trachea of a five-year-old boy for three days. After the administration of chloroform, it was removed by means of a long curved Leonard forceps *per vias naturales.*

In the experience of the author, thyrotomy, laryngotomy and tracheotomy for the removal of foreign bodies, although simple in technique, result unfavorably in the majority of cases. In six operations by the author, all save two proved fatal. *Scheppegrell*

WESTERN SECTION, AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY.*

ANNUAL MEETING, SAN FRANCISCO, CAL., MARCH 31, 1899.

DR. H. L. WAGNER, the Vice-president, delivered the address of welcome.

DR. M. A. MARTIN, of San Francisco, opened the regular scientific portion of the business by the presentation of two short papers:

I. Hemorrhages Following Adenoid Operations.

DR. MARTIN stated that there is much more danger in adenoid operations than we are accustomed to believe. He had had no trouble for some years, but afterwards found that his early experience was nothing but good luck. Illustrative of the sort of complication referred to he cited three cases occuring during the past year.

DR. ADOLPH BARKAN considered the operation for the removal of adenoids a very serious one. The pharyngeal tonsil was the one of the three most liable to give trouble, and he makes it a rule never to operate on the three at once, and always insisted on having the patient in the hospital for at least 24 hours for adenoid operations. He does not operate unless the patients go to the hospital. As a routine of procedure, he first introduces a silk thread through the soft catheter, leaving it in place through the nose and mouth until several hours have past and no trouble is evident. It is easier to pass the thread before the operation, when the patient is quiet, than in the face of a severe hemorrhage, when the patient is excited and weakened by severe bleeding.

DR. SAMPSON TRASK in discussing hemorrhage after adenoid operations, stated there was always to be remembered the danger of hemorrhage following operations on the throat. Especially is this true after operation on the third tonsil. He considered it unwise to operate in these

*[Journ. Amer. Med. Assn., Apr. 15, 1899.]

affections during the existence of any acute inflammatory process.

DR. MARTIN stated that undoubtedly the hospital was the best place in which to operate for the removal of adenoid growths, but unfortunately all patients do not have the necessary means to go to a hospital and also pay for the operation. The placing of a silk thread, before the operation, as suggested by Dr. Fehleisen was also an excellent idea, but in two of the three cases which he had just reported, the thread would have been removed even by Dr. Barkan long before the hemorrhage occurred. In one there was no hemorrhage to amount to anything within 24 hours, and no considerable hemorrhage until the fifth day. In the last case the alarming hemorrhage did not appear until the ninth day after the operation. He had made use of extract of suprarenal capsule in two or three cases, and so far thought well of it. In one case in which he had operated to divide a band between the middle turbinate and the septum, he met with excessive hemorrhage after the first cut, in spite of the fact that he had made liberal use of the solution of the suprarenal gland. What it would really be worth remained to be seen.

II. A Case of Empyema of the Sinus Frontalis.

DR. MARTIN saw this case first in May, 1898, when there was a large swelling at the inner angle of the orbit of the left eye; the root of the nose on that side was also swollen. Some polypi had been removed. The orbital trouble had been increasing for some time past; the man had been afflicted with the disease for several years. The anterior portion of the left middle turbinate was snared away and an attempt was made to probe the cavity without beneficial result. The collection of pus over the orbit was producing so much discomfort that this was first removed by making an incision into the pus-sac just below the orbital ridge. About two ounces of pus discharged. Three days later the frontal sinus was opened by means of a bone flap just to the left of the inner angle. The frontal sinus was found to be greatly involved; this was curetted carefully. The ethmoidal cells were involved somewhat; drainage tube was introduced and retained for three months; wound then closed. Shortly afterward pus was found to have

gathered again, and the wound was reopened. It was now washed and irrigated and a solution of iodoform in absolute alcohol injected. The patient eventually made a good recovery with slight deformity.

Empyema of the Sinus Frontalis.

DR. F. FEHLEISEN, of San Francisco, read a paper on this subject and said that he had operated on some thirty cases, some acute, with fever, etc., but most were old chronic cases which had persisted for years. He formerly trepined just above the eyebrow, near the nose, and cleaned out the sinus as well as he could through this small opening. This method he found not satisfactory and he now performed a more radical operation. In the old method all the diseased tissue was rarely removed, and as a result there was long continued discharge from the sinus and poor healing of the wound. Now he removes the entire interior of the sinuses, scraping out not only the mucous membrane but also the diseased bone which he finds present in nearly all old cases. The anterior table over the entire affected region is removed and no diseased tissue allowed to remain. The wounds heal readily and the condition is cured. He presented two cases.

In the author's opinion, it is not enough to remove the mucous membrane alone, but the softened bone, and where there is a fistula, the floor of the sinus should be removed. The cases where exhibited, and though the disease was undoubtedly cured, the resulting scars were very unsightly. As the anterior wall had been removed, there was a marked depression over the eyes, of irregular outline and ragged appearance.

DR. KASPER PISCHELL said that in both cases the eyes had been pushed down and out; there was hypophoria and esophoria, bnt no binocular vision. In both cases the vision was very good. Transillumination had been tried on these cases, but it was of but little value in affections of the frontal sinus. He thought it useless to try syringing in these cases, as there was always a great degenerated mucous membrane and often much granulation tissue, which must be removed before suppuration will cease and the wound heal. A more radical operation is much to be preferred.

In most cases there is no direct effect on the sight due to optic nerve involvement, but this does occasionally occur. He cited a case on which he had recently operated, in which the optic nerve had become involved through spread of the inflammatory condition. The disease was caused by repeated severe colds following an attack of grippe. He could nearly, but not quite, probe the frontal sinus through the natural opening, and found the customary pain when the probe came near the inner angle of the orbit. Operation relieved the trouble with the sinus, but not the nerve affection.

DR. F. B. EATON thought it rather too heroic to make such a radical operation as was done in the cases presented by Dr. Fehleisen, The disfigurement was very great. He thought it much more advisable to treat it by packing through the sinus or a small opening, and most if not all cases could be cured. The treatment is tedious but efficacious. He called attention to the method advocated by Gulovein, in which hot steam is injected into the cavity through a small tube first introduced either through the fistula, if such be present, through the natural opening, if it be possible, or through a small incision.

DR. SAMPSON TRASK stated that the cases presented by Dr. Fehleisen were instructive as to the result of the more radical operation, but he himself was more conservative, thinking that simpler means, though they consumed more time, yielded cures and did not leave unsightly scars. He called attention to the normal opening into the frontal sinus, which he thought might be more extensively used. Removal of the anterior portion of the middle turbinate generally made it possible to probe the sinus in this manner.

DR. FEHLEISEN was much interested in the proposed use of hot steam for dealing with these affections, but had not yet been able to make use of it. He thought that if there had been, for some time, a fistula in the floor of the frontal sinus only, the removal of the diseased bone would effect a cure.

DR. MARTIN thought the specialist gave more thought to the ultimate cosmetic result of an operation than did the

general surgeon. Specialists therefore were rather loath to undertake the extremely radical operation for removing the anterior table over the frontal sinuses, and were willing to spend more time in the slower method of treatment when there is any chance of its being eventually successful. He had quite cured a severe case by the injection of a solution of iodoform and absolute alcohol through a canula introduced by means of the ostium frontalis. The treatment covered a period of one and a half years, but the patient was more than willing to put up with the long treatment rather than be disfigured by the radical operation.

Unilateral Hypertrophy of the Face.

DR. DOUGLASS W. MONTGOMERY, of San Francisco, made a further report of a case of unilateral hypertrophy of the face, with unilateral hypertrophy of the hard palate and gums. The history of this exceedingly rare condition, which was so unusually well-marked in the case exhibited, was as follows: The patient, a man of about 45 years, had been under observation by the doctor since 1893. His parents were German and so far as could be ascertained perfectly normal. The man's birth and life up to the fifth year certainly were also normal. A photograph taken at the fifth year shows no peculiarity. A photograph taken at the tenth year, on the contrary, shows the condition commencing. A slight enlargement of the left side of the face could be noticed in the photograph taken when the patient was 10 years old. The hypertrophy was very well marked and was absolutely unilateral, the median line very exactly marking the line of hypertrophy. Along the head and forehead was a large roll of bone; the malar was very prominently enlarged; the skin as well as the bones on that side of the face was the seat of hypertropic changes. Indeed, in 1893 a very large roll of skin had been removed by operation, from just beneath the left eye, where it acted mechanically in disturbing the man's vision. This had not returned since the time of operation. The lips, gums and hard palate were greatly enlarged, and a cast of the mouth, which was shown, exhibited this peculiar condition most strikingly. The skin on the left side of the face was markedly red, but Dr. Montgomery stated

that it was not as red as it had been three years ago; he thought the condition was receding to a certain extent. Certainly it seems to be at a standstill. There was no enlargement of any other portion of the body, either on that side or the other. There was no enlargement of the hypophysis, and the case was surely not one of acromegaly. Dr. Montgomery called attention to the excessive rarity of the condition, and mentioned all the cases thus far reported, the first being by Beck in 1836. Almost all of the cases reported were, however, congenital; this one was not, but a clear case of acquired, progressive unilateral hypertrophy of the face. No explanation of the phenomenon was attempted.

Otologic Experience During the Naval Battle of Santiago, on Board the Iowa.

DR. M. M. SIMONS, U. S. N., first considered the two kinds of powder used on board, the brown prismatic and the so-called smokeless powder. In the brown, some of of the grains are unburned, and by the explosion are finally powdered. This dust is often blown back on the decks of the ship and is somewhat irritating to the mucous membranes. It causes slight congestion which passes rapidly away. The smokeless powder does produce some slight amount of smoke, or rather haziness in the air, after a discharge of a large amount. Carbonic oxide gas forms in the breech, and when the latter is opened it is changed to carbon dioxide; no ill effects were noted from this gas. After a number of discharges, the decks become hazy with the fumes from this powder, and there is noticed a slight though decided acid smell. It is extremely irritating to all mucous membranes, though no serious trouble results. When the decks are washed down after the firing has ceased, all this passes away. After the battle of Santiago there were several cases of nasal, tonsillar and ocular inflammation. These were simple and yielded at once to treatment. A few were deaf, some for from two to four days, but they all recovered by the use of inhalations and Politzerization. Only two cases were observed in which there was rupture of the tympanum. Here there was no pain, but the patients complained of

tinnitus. He stated that he was himself slightly deaf as a result of that engagement. When a gun is fired there is a feeling of a sudden blow, something like the blow from a bar of iron. With the small guns this is quite sharp, but with the large guns it is more heavy. Some complained of general muscular soreness after the battle. The two cases of perforation occurred in the vicinity of the eight-inch gun. In his opinion, the deafness was the result of the irritation of the throat, primarily, this producing a closure of the Eustachian tube; a subsequent heavy discharge would force in the tympanum, thus forcing out a small amount of air which could not return and hence the drum would be somewhat retracted and slight deafness result.

DR. M. A. MARTIN had seen some cases of rupture of the drum membrane from explosions, and thought the explanation was not that suggested by Dr. Simons, but more in the nature of an outward thrust of air in the middle ear, occurring at the time when the wave of rarefaction, or partial vacuum, struck the ear; in other words, that the rupture is due to pressure within.

DR. F. B. EATON agreed with Dr. Simons, and artillerymen had told him to keep his mouth open when near a large gun about to be fired, saying that this prevented injury to the ear. He thought the impact of the wave could do more damage than the pressure from within.

DR. SIMONS had not noticed any cases of deafness until the guns had been firing for at least 15 minutes, during which time the gases had accumulated and produced their irritating effect. He spoke of the difference which relative positions had in the effect, but said that one could not choose his attitude, for guns were going off above, below and on all sides. The irritation of the fumes was much like the irritation produced by holding the head over a vessel of weak formalin solution. *Scheppegrell.*

AMERICAN LARYNGOLOGICAL ASSOCIATION.*

TWENTY-FIRST ANNUAL CONGRESS, HELD AT CHICAGO, MAY 22-24, 1899.

FIRST DAY.

President's Address, delivered by Dr. William E. Casselberry, of Chicago. I think all are conscious of the change in the drift of laryngological practice wrought in recent years; first by the evolution of nasal pathology, and secondly by the appropriation of the ear. From a physician treating affections of the throat and chest, the laryngologist is fast becoming a surgeon with a routine limited to local measures as applicable to the upper respiratory tract alone. While freely conceding that practice has been realized along local surgical lines, I deprecate the tendency of the day to deal with the throat and nose exclusively in a mechanical way as if they were organs detached. I believe it engenders narrowness of thought and that through habitual disuse there is gradually lost to the physician much of that fundamental knowledge of pathology and thereapeutics which is so essential to the welfare of the patient. There are now nasal enthusiasts whose idea of the entire subject seems to consist in the establishment of a wide patency of the nostrils. The intimacy of the ear with the nose and throat is conceded. The laryngologist has the treatment of aural affections actually thrust upon him. Even the patient's discernment convinces him that the laryngologist's skill and equipment are the means best adapted to the end, and having appropriated the ear, one should cultivate an exhaustive knowledge of the organ, but as an addition to laryngologic lore, not as substitute for a part thereof. It is not claimed that the laryngologist must of necessity embrace in his practice all pulmonary diseases, but it is urged that he be ready to apply all the arts of diagnosis and that he be conversant with every resource known to medicine in the treatment of pulmonary condi-

*From the Philadelphia Medical Journal.

tions in their relation to the throat. Nor will it answer to omit attention to the heart, aorta, or mediastinal contents. Paralysis of a vocal cord through pressure on the recurrent nerve by an aneurysm is a simple proposition, but more complicated ones which require a high degree of diagnostic skill are continually encountered. Above all, one should study the conditions of natural immunity and susceptibility in order that having made an early diagnosis one may direct the mode of life and place of abode best adapted to arrest the disease and overcome the susceptibility. This implies a ready familiarity with sanitation, hydrotherapy, climatology and sanitarium resources and methods. All laryngologists are familiar with the many throat conditions which appear as salient features of underlying systemic states, and yet in the overswing of the movement toward localism general pathologic data, systemic therapeutics and hygienic aids are not always utilized to the utmost. The laryngologist should continue to be first of all a good physician and after that, something more—a specialist.

Is the So-called American Voice Due to Catarrhal or Other Pathological Conditions of the Upper Air-passages? By Dr. John W. Farlow, of Boston. By American voice is meant the charistic nasal twang so commonly noticed. Conditions of the larynx and fauces, which causes their own distinctive vocal impairment are not here considered, as we do not mean by American voice the thick voice, and that of low carrying power. Any condition which hinders the passage of air into the nose tends to diminish the nasal resonance, and does not contribute to the production of the nasal voice. When anterior septal deviations and spurs exist the air during vocalization vibrates abnormally in the nasal chambers, so also when the nose is narrowed at the tip which, perhaps, may be bent downward and when there are anterior polyps and anterior turbinal enlargements, chronic catarrhal inflammation of the mucosa often occurs without hypertrophy. From all these causes there result anesthesia and paresis of the soft palate, and some of the tones which should be formed in the mouth are formed higher in the nasopharyngeal space. This explains the occurrence and persistance for a while

after operation of the peculiar voice in adenoids until the plate has regained the tones lost from disuse. Atrophic rhinitis does not seem to cause a nasal voice. In those under 12 years old the nasal voice is common, but the lesions enumerated above which might seem to stand in a causative relation thereto are not common. In those between 12 and 30, they are more common than in the first class, but the occurrence of the nasal voice is not more common and does not appear, therefore, to have any constant relation with the apparrent formative causes. In those over 30 the nasal voice is less common than earlier in life. It is thus obvious that the nose is not the determining factor in the formation of the nasal voice, because the nasal lesions do not determine the classification into nasal and non-nasal voices. The voice can often be improved by training without any medical or surgical intervention, and pathologic states have more to do with the range and power of endurance of the singing voice than with the quality in the middle register. The nasal voice is more often merely a matter of imitation. Good public speakers and actors with good voices have, from a purely anatomic point of view, very poor vocal organs. Anterior nasal obstructions are common in all civilized races. Some of the most pronounced nasal voices are heard in our country villages. The great influx of foreigners has introduced all sorts of vocal sounds and methods of speaking English into common speech, and we are quite indifferent as to the best methods of speaking. Hence children should be carefully trained in this respect, for in them, imitation of the vicious vocal methods they constantly hear is the most potent factor in the production of nasal voice.

In discussion, Dr. G. Hudson Makuen, of Philadelphia, said, that far more attention should be given to proper vocal methods. As a rule, physicians knew little about the subject. Laryngologists should instruct singing teachers. The American voice is due to the excessive tension of modern American life. The active anatomic factor in nasal voice is probably a low-hanging palate during speech. The sound-vibrations are centered in the postnasal space. We must train the levator palati muscles, which can be done by having the patient practice several

times daily with *open* mouth before a mirror. Dr. I. Amory DeBlois, of Boston, thought that racial condition had much to do with the character of the voice. We are all familiar with the guttural of the German, the vibratory nasal French voice, and the high-pitched voice of the Yankee, while the English voice, no matter what the social rank, is always of an agreeable low pitch. Dr. John O. Roe said that the nasal sinuses had much to do with voice-production, as they acted as resonators. The voice depends on the shape and size of the cavities, which vary greatly. Anterior nasal obstruction does not cut off the influence of the resonators, while posterior obstruction does. So, also, the peculiarities of the various languages are a factor. Those who use many consonants, as Germans and Russians, have low-pitched voices, while an excessive use of the vowels conduces to the opposite result. Dr. A. W. de Roaldes, of New Orleans, spoke of American conversational habits, and of the fact that in the South the conversational tone is much lower than in the North. This may be due to a mixing of various race-bloods in the former, and to the lazier mode of life. The negro voice was not much addicted to the tonalities. Dr. Thomas Hubbard, of Toledo, thought that much of our high-pitched speaking was due to the noise of our American cities, where it was often necessary to speak in a loud high tone in order to be heard. So, also, from the noisy environment the ear becomes obtunded to the appreciation of such misuse of the voice. Dr. Farlow said that the low palate was often due to a lack of use, but was not the original cause of the nasal voice. Its causative relation was secondary not primary. He had noted that nasal voice was common in children, in whom the sinuses were scarcely at all developed. English is spoken in many countries, in none of which does the voice have the same qualities as in this country. Voice is not, therefore, primarily a matter of language. He had often noticed the most pronounced cases of nasal twang in country villages.

Adeno-carcinoma of Nose, with Report of Case. By Dr. James E. Newcomb, of New York. Up to last year there were on record the notes of 23 similar cases in which the clinical diagnosis had been verified by microscopic exam-

ination. This case was that of a widow, aged 61 years, of American parentage, who had suffered since June, 1898, with obstruction in the left naris and almost daily nose-bleed, severe on one or two occasions, but never requiring operative interference. At times there had been a slight watery discharge with a slightly offensive odor. She had lost some flesh and strength. In September last, she had blown from that side of the nose what she described as a "fleshy bean" and which was probably an ordinary polyp. The left middle turbinate was considerably enlarged and the mucosa over it seemed to be in a condition of polypoid degeneration. About it were some fleshy proliferations which bled easily upon manipulation with the probe. There were no glandular enlargements and no pressure-symptoms. The masses were removed under cocain-anesthesia without incident. The report of the microscopist was adeno-carcinoma. Radical interference was refused by the patient. Cancer of the nose is relatively rare. It is claimed that there is nothing more than coincidence between the association of the ordinary polyp with carcinoma. Tissier does not believe that the epitheliomatous degeneration of simple polyps has ever been definitely proven. What we know, he says, about the etiology of polyps explains their occurrence in a cancerous nasal fossa. On the other hand, Plique states that it is pretty frequent after the ablation of numerous benign polyps, to find new polypi appearing, composed this time of epitheliomatous tissue. Dr. Newcomb could hardly accept the truth of the latter statement, for polyps were very numerous and were often removed by very crude means, while the occurrence of cancer here was so rare. Dr. G. V. Woolen, of Indianopolis, related the history of a case of malignant disease of the nose occurring in a girl of 8 years, following an injury received two years before. Nasal polypi, so called, were removed and pronounced by the microscopist to be nonmalignant and only simply mucoid in character. Pressure-symptoms were prominent. The growth was found to recur over an increasing area, and the case was pronounced to be nonoperable. Later clinical history clearly demonstrated the fact of malignancy. Dr. J. L. Goodale, of Boston, mentioned a case of adeno-carcinoma of the nose occurring in a man of 51

years. The left naris was filled with a soft bleeding mass showing after removal and examination a fibrous stroma with epithelial cell-nests. There was bulging of the eye, much pain and nasal obstruction. Removal was followed by recurrence. Dr. Newcomb urged more hearty cooperation and association of the clinician with the microscopist in the early management of cases of doubtful nature in their incipiency.

Removal of Foreign Body from Bronchus Through Tracheal Opening was a paper by Dr. A. Coolidge, Jr., of Boston. A teamster, aged 23, was admitted to hospital a year ago, having worn a tracheal tube for 20 years. Twelve hours before admission the tube had become detached from the shield and had been drawn into the bronchus. On admission, severe cough, dyspnea and noisy breathing were present. Examination by x-ray was negative. Patient was etherized on the back with the shoulders over the end of the table with the head held downward and rotated to the right side. The tracheal wound was enlarged downward. A urethroscope one-half inch in diameter and three inches long was passed down the trachea with the stiletto in place, and when the stiletto was withdrawn, a speculum was pushed down the trachea without any difficulty to within about one inch of the bifurcation. Under sunlight illumination with the hand-mirror, the tube was seen in the right bronchus with its upper end half an inch below the bifurcation. Alligator forceps introduced through the speculum extracted it without difficulty. No ill after-effects were noted. There was some inconvenience at first from coughing, but none from secretion. The mucosa of the trachea was cocainized. In case a body is large enough to make it probable that it has gone no lower than a primary bronchus, immediately tracheotomize and explore by means of straight tubes as large as possible. If the body is in a secondary bronchus operative interference is justifiable if there is a good chance of reaching it after illuminating the primary bronchus, as would be the case, especially on the right side. A body loose in the trachea is much less dangerous than the same body impacted in a bronchial tube, and hence any violent respiratory excitement should be avoided. It.

is better to tracheotomize under cocain than under ether. In special cases tracheotomy may be avoided by introducing straight tubes through the glottis from above, but if the body is being rattled to and fro in the trachea, it would not be justifiable to run any farther risk of its being inhaled. Even when it is in the larynx in such a position that attempts at removal are likely to push it farther down, it is safer to do a tracheotomy and reach it from below. That absolute surgical cleanliness is necessary to present septic pneumonia goes without saying. A favoring circumstance in the use of the straight tubes is the flexibility of the lower part of the trachea and bronchial tubes, which permit considerable straightening or bringing into line the bronchus under observation. Dr. H. L. Swain, of New Haven, said that statistics show that foreign bodies are frequently expelled, sometimes months after they have entered the air-tubes. Ulceration is set up and they become dislodged. Dr. Roe stated that in thousands of instances the body had been expelled. The best results came from leaving it alone if it is not producing active symptoms. Dr. de Roaldes believes that we should not hesitate to operate. In 7 out of his 8 cases, the body had been removed through the tracheal wound. A low tracheotomy should be done and the bronchus titillated so as to excite cough, the edges of the tracheal wound being held open. We ought not to advise non-interference. Dr. Woolen thought that if there were no immediate symptoms and if we knew the body to be of such a nature that it could be easily expelled it was advisable to defer operation.

Exhibition of a Case of Stammering with Demonstration of Methods Employed in the Treatment, was considered by Dr. G. Hudson Makuen, of Philadelphia. The patient was a civil engineer, aged 29, who had stammered since the period of voice-formation. There was no assignable cause for the affection, which seemed to be the outcome of a congenital neurosis. The chief characteristic of the defect was spasmodic contraction of the muscles of the soft palate resulting in sudden closure, during attempts at vocalization and articulation, of what Dr. Makuen called the posterior palatolingual chink. These spasms were of

variable frequency and duration and came on at most unexpected times. They gave the speech a peculiar jerky character and sometimes blocked it entirely. The defect was more pronounced in reading than in speaking. There was also a sort of mental hesitation and he could not always think correctly. In normal speeh, the action of the muscles is entirely automatic, and when any of the mechanisms employed fails to perform its functions this automatic action becomes impaired and it is the effort to control the lagging mechanism and to bring it into harmony with the other mechanisms that constitute the chief difficulty of the stammerer. In this particular instance the respiratory mechanism was at fault. Resort was had to direct nerve-muscle training, that is the singling out of the muscles with faulty action and by training them by means of voluntary exercises to properly functionate. This is superior to the indirect method which leads the patient unconsciously by means of approximately correct speech to use the muscles properly. The former methods develops the nerves as well as the muscles and establishes a volitional control over the faulty mechanism.

Report of Cases of Chronic Empyema of the Antrum of Highmore Operated upon by the Caldwell-Luc Method was made by Dr. A. W. de Roaldes, of New Orleans. Five cases were reported, in all a radical and speedy cure being obtained. It is surprising that this plan of operation, originally devised in this country, has not been more generally followed. It is believed to be superior to the older plans. The various steps of the operation can be summarized as follows: (1) A buccal incision is made parallel with and near enough to the upper gingivolabial fold in order to allow of the subsequent easy union of the muco-periosteal flaps. (2) The anterior wall of the antrum is opened in the canine fossa, the opening being ovoid in shape. Its extremeties give easy access to the tuberosity on one side and to the nasal wall on the other. (3) The cavity is thoroughly curetted and all diseased tissue removed. (4) A portion of the anterior extremity of the inferior turbinate is removed. (5) A large artificial opening is made in the nasal wall of the antrum as close as possible to the angle formed by the floor and anterior wall.

(6) The cavity is finally inspected, cleansed, dried, and lightly dusted with iodoform, followed by suture of the mucoperiostal flaps. Iodoform gauze is gently packed into the antrum and also into the nasal fossa, changed on the third to fifth day and afterward on alternate days until the twelfth day. The patient is then allowed to irrigate the cavity with a syringe and cannula, using boric acid solution. In one case a little secretion could sometimes be found at the entrance of the sinus, but this was ascribed to an old ethmoidal trouble, the pus leaking into the sinus through an opening in the nasal wall from old necrosis. Dr. de Roaldes dwelt especially upon the importance of locating any other possible focus of suppuration, as the latter may prove a serious complication or materially retard healing. Dr. Rose said that we ought to consider the level of the antral floor with reference to that of the nose, and also that the existence of pockets or septums in the antrum often prevents proper drainage of the latter even after incision has been made. Dr. E. L. Shurly, of Detroit, did not believe that operation was always necessary. Acute cases (as after grip) often get well of themselves, but in chronic cases curetting will often be necessary. He did not believe there was any positive evidence of infection through the mouth, but the opening into the nasal fossa would in his judgment offer far greater chance of such infection. Dr. Makuen said that the law of gravity did not seem to hold good in normal drainage of the antrum, as the opening was nearer the top than the bottom. Drainage seemed to be regulated by some sort of capillary attraction. Dr. G. A. Leland, of Boston, remarked that man was not always an upright animal and that when lying down, the antrum was drained by gravity. If the natural opening could be kept patent, many of the cases could be cured without operation. The Caldwell-Luc method was really a combination of those of Mikulicz and Jansen.

Septic Phlebitis with Thrombus as a Complication of Peritonsillar Abscess, Report of two Cases, was the title of a paper by Dr. M. R. Ward, of Pittsburg. His first personal case was that of a woman, aged 30. Three weeks previously she had had pain and soreness in the left tonsil,

which subsided. Three days later there was a right peritonsillitis, with a tumor in the right side of the neck, and enlargement of the postcervical glands. Palpation did not detect fluctuation. The muscles of the neck swelled, fever developed, with evidence of pneumonia in the lower lobe of the right lung, and of pus beneath the superficial fascia of the neck. Incision was made, but pyemia proved fatal on ninth day. Autopsy showed a thrombus in the internal jugular, with septic phlebitis running to the tonsillar plexus. His second case was that of a German male, aged 42, who had an ordinary quinsy, which was incised. Two days later there was a chill with renewal of all throat symptoms. Death occurred on the sixth day from pyema. Autopsy as in first case, with, in addition, multiple abscesses in the kidneys.

Acute Suppurative Process in the Faucial Tonsils was the subject of Dr. J. L. Goodale, of Boston, and was based upon a study of 8 cases of intrafollicular abscess, calling special attention to the etiologic relation of special bacteria to these cases, of the latter's relation to peritonsillar abscess, of their prognostic significance, and their clinical recognition. Streptococci were more numerous than staphylococci. Of the 8 cases, 2 were followed by peritonsillar abscess. In all there was severe infection, as evidenced by the swelling in the neck, temperature curve, and general course of the symptoms. In most cases the tonsil presented no gross appearance, which would suggest intrafollicular abscess, which varied in size and number. The fibrinous exudation was more marked than in simple proliferative tonsillitis. The pyogenic infection of the follicles seemed secondary to that of the crypts, and in the two peritonsillar cases there seemed to be a discharge of the abscess into the efferent lymph-channels.

Peritonsillar Abscess was considered by Dr. G. A. Leland, of Boston. The best method of relieving these cases is to make a long incision vertically through the tonsil, and then with the sterilized finger to thoroughly explore through this incision the pus-pockets. The method is not dangerous, but is very painful, and a few whiffs of an anesthetic may be necessary. Its advantages

are that the abscess is drained from the bottom, recovery is prompt, and there are no relapses. The patient is able to swallow liquids in 6 hours, and solids in 12. In case the incision is slow in healing, applications of iodin and glycerin are made to the bottom. This operation is really a century old, but has fallen into disuse.

Peritonsillar Abscess Associated with Diphtheria: Report of Cases, was a paper by Dr. Thomas Hubbard, of Toledo. A farmer aged 30 had acute tonsillitis. Five days later a right peritonsillar abscess developed. Löffler bacilli were present on tonsil. Antitoxin was given, but the next day there was evidence of membrane in the trachea. Dyspnea soon became so marked that tracheotomy was done. The patient stopped breathing, but was brought around after an hour of artificial respiration. Death from pulmonary edema followed in 18 hours. A second similar case was described. In the latter instance different members of the same family were variously affected, ranging from ordinary simple tonsilitis to fatal diphtheria. In incising such cases care should be taken to definitely locate the pus so that the knife should pass through tissues devitalized by softening. Dr. F. C. Cobb, of Boston, exhibited some photopraphs illustrating wax injections through the tonsillar crypts into the pharyngo-maxillary space, the injections showing the same direction of extension as did the pus in the course of the actual abscess cases. Dr. Newcomb mentioned a case (recently reported by Sendziak) of diphtheria associated with multiple abscesses in the various tonsils and empyema of both antral cavities. The phlegmon about the lingual tonsil opened spontaneously and a profuse hemorrhage ensued.

A case of **fibro-lipoma of tonsil** was reported by Dr. T. Amory De Blois, of Boston. Patient, male of 30 years, presented a growth in left tonsil, pedicled and of the size of a peanut-kernel. Removal was done under cocain and with the cautery snare. A section of the growth was shown under the microscope.

Second Day.

Discussion: The Relation of Pathological Conditions in the Ethmoid Region of the Nose and Asthma. Dr. Henry

L. Swain, of New Haven, in considering the pathologic side, said asthma means a hyperesthesia of the bronchial lining with a resulting explosion of energy. In addition, some other structure is diseased, irritations of which sets up the bronchial spasm, a condition called the neurotic habit. The nose is only one of many diseased sites which can produce an asthmatic attack. It may arise from some intranasal irritation. Certain irritations applied to certain nerve-fibers will produce conjection and chronic inflammation with swelling and watery discharge. Then come soaking of the tissues, edematous changes and polypi. In many of these cases of hyperesthetic mucosa there seems to be all over the body a thinness or flabbiness of the blood-vessel walls and a vasomotor responsiveness, which make possible the explosions which are the bane of the existence of these afflicted mortals. This character of vessel wall may be the inherent peculiarity of the neurotic subject. Such a theory would explain the headache, asthma, neuralgia, etc., which at the start are only vasomotor spasms. Later, by continued distension of the vessels, their walls become permanently stretched and flabby, and thus organic lesions are possible. In general the ethmoid or middle turbinate changes in all these cases are hypertrophic and confined to the mucosa. Septal spurs and bends tend to keep up the middle turbinate disease and increase the possibility of pressure. Repeated irritations gradually lead to vascular relaxation and the occurrence of edematous tissue. In turn, come contact areas and areas of pressure. With the latter present, the initiative of the asthmatic attack is easy if at the same time the bronchial apparatus is also diseased or susceptible. The clinical phase of the subject was discussed by Dr. E. Fletcher Ingals, of Chicago. In 3 cases the patients had asserted that they had had spasm in only one lung which corresponded to the side in which intranasal lesions were present. One patient was subject to attacks when on the ground, but was relieved by going to the sixth story of a character only a few blocks away has cured others. Even a change from the brick portion to the wooden portion of the same building has sufficed to relieve some cases. Dr. Ingals had found that a spray containing 3 per cent. of cocain and 5 per cent. of soda nitrate would

often relieve aparently by a reduction of the sensitiveness of the bronchial mucosa. Treatment was discussed by Dr. F. H. Bosworth, of New York. He believed that the whole question turned upon the integrity of the respiratory function of the nose. The bronchi were only air-conductors, but there was an intimate relation between their mucosa and that of the nares. In asthma the condition was one of vasomotor paresis, not of muscular spasm. Behind the polypi, the polypoid degeneration and the edematous hypertrophy, is an ethmoiditis. The great indication for treatment is to relieve the ethmoiditis, to relieve the intracellular pressure by breaking down the honeycombed mass. A radical operation is necessary. It is not enough merely to remove the polyps. We must uncap the eggshell-like ethmoid. Points of contact should also be eliminated, not so much because of the pressure there exerted but because they encroach upon the lumen of the nares. In his own experience cutting forceps were unsatisfactory. He used rounded and oval burrs from one sixteenth to one quarter inch in diameter driven by power. We should burr down, stop, use burr as probe, revolve it again until all the thin trabeculæ are broken down and free drainage is established. In nearly every case treatment confined to the anterior cells is sufficient. Dr. Bosworth stated that he had never had any bad results in following the above rules. He formerly held that if cocain applied to the nose did not relieve an asthmatic attack it was useless to do any intranasal operation, but later experience had led him to modify his view. Purulent ethmoiditis does not cause asthma; but inflammatory disease does. Many colds in the head are doubtless acute ethmoiditis. In the general discussion Dr. E. L. Shurly remarked that the question was a difficult one on account of the complex physiology of the vasomotor system. We should look further back than the ethmoiditis and the edematous rhinitis. Recent experiments have shown that the filaments from the cranial nerves and the spinal cord are really conducting cables and that in the same one there may be filaments for various functions. In different animals and in different individuals of the same group, there is a great difference in the communicating branches between the nerve-trunks. These anatomic variations explain the

peculiarities in individual cases. Moreover, it must not be forgotten that the nose has an olfactory as well as a respiratory function, though in man the former is very rudimentary. Impulses may travel along the sensory filaments and owing to defective insulation, as it were, may produce hyperesthesia. Even asthma cases should be divided into those due to local disease and those due to psychic influences. He must take exception to the statement that the bronchial tubes were mere air-conduits. There is a peculiar arrangement of the adenoid tissue in them, the function of which we do not know. Dr. Mackenzie said that the primal cause of asthma was not confined to any special peripheral organ, but that it resides in the individual as a whole. The area of nerve-explosion depends on the seat of the local pathologic process. Irritation may come from a peripheral organ as the nose, a distant organ as the uterus or from a general dyscrasia as gout. On this theory mere contract-areas and pressure-points are of no value. Nasal cough may arise in atrophic states of the organ. Final explanation is not to be sought in nasal or bronchial abnormities, for all the theories thus far advanced fail to conform to the requirements of a logical hypothesis. All polypoid degeneration is not due to an ethmoiditis, as is evidenced by both clinical and pathological observation. As to treatment he had no difficulty with the forceps. It is useless to temporize and we must curette, burr, and gouge freely. Dr. Makuen said that asthma depended on faulty nervimuscular action which might be due to any one of the thousand causes. Dr. Hubbard called attention to the autotoxemia theory. Such autopoisoning may be due to gastroenteric absorption or faulty elimination. Such a possible factor must be borne in mind in the study of each individual case.

Recurrence of the Tonsil after Excision: a Case of Hysterical Larynx, was the title of a paper by Dr. F. E. Hopkins, of Springfield, Mass. In discussing the subject of the recurrence of tonsils after excision, Dr. Farlow remarked that partial removal left behind diseased tissue, especially in the lower prolongation of the organ where the irritation of the lingual movements against the hardest part was apt to produce recurrence. Guillotines were usually em-

ployed for removal, but the ideal instrument was one which would actually get in between the anterior and posterior pillars. All tonsillar tissue should be removed and not merely the part projecting beyond the pillars. Dr. Farlow strongly advocated the use of scissors or forceps. He also called attention to the development, especially in young adults, of the plica triangularis, or fold of tissue running down diagonally over the anterior surface of the tonsil, which was often mistaken for a portion of the anterior pillar. It should be included in the tissue to be removed. Dr. Newcomb believed that recurrence often happened in tenement-house children who, after operation, were compelled to go back to the same general bad surroundings. Dr. Woolen said that a tonsil once removed can never return. He believed that what we call a tonsil is really a pathologic product which he viewed as he would a wart or a pipilloma, not indeed always requiring removal. He preferred the term "enucleation" to "excision." He used a guillotine without a fork—lifting the tonsil from its bed with a vulsellum. He tested the organ removed with a probe passed down through the crypts, and if it reached a solid bottom, he knew that he had removed the follicles entire, but if it easily passed through and came out on the other side, he was convinced that the operation had been incomplete. These roots of tissue left behind might easily provoke a quinsy. Dr. D. Braden Kyle, of Philadelphia, would look upon a recurring tonsil as a purely pathologic product, benign, it is true, and of a hyperplastic nature. It was the soft and spongy tonsil which was apt to recur. The recurring mass was more of a tumor than a tonsil, and somewhat on the order of an adenoma. Dr. Makuen called attention to the necessity of properly separating adherent faucial pillars before any instrument for removal was applied, and had devised for that purpose a special set of cutting blades.

Third Day.

Fibro-lipoma of the Epiglottis and Base of the Tongue was the subject of Dr. E. Fletcher Ingals, of Chicago. His patient was a farmer, aged 28, who, for 3 or 4 years, had had difficult breathing, swallowing, and speaking. In

1896, the cautery had been used on the base of the tongue, along with the snare and scissors, and a mass removed. He came under Dr. Ingals' observation in February of the present year. Symptoms had all increased in severity during the two preceding months, especially dyspnea on lying down. On examination, a smooth mass, with a congested surface, could be seen in the laryngopharynx, apparently attached to the right side of the pharynx and base of the tongue, being apparently of a fibrous nature. On attempting its removal with a cold snare, carrying a No. 5 wire, the latter broke three times. Later, a properly bent uterine ecraseur, carrying a No. 8 wire, was used, and removal effected without difficulty. Several sittings were necessary to secure entire removal. Some of the masses were purely fibrous, some fatty, and some of the mixed type. Attachment was, as above noted, with, in addition, the right side of the epiglottis. The patient was recently seen, and it was noted that the right side of the epiglottis had become adherent to the right side of the pharynx and the base of the tongue. Such adhesions would prevent the epiglottis from closing down over the larynx during deglutition, but in this case there was no difficulty with this function. Dr. Woolen mentioned a somewhat similar case. The patient had been exhibited several times to students previous to operation, and the wire slipped over the growth, in order to show them the mode of removal. When the latter was actually attempted, the patient suddenly stopped breathing. Artificial respiration restored him, but upon a second attempt the same accident recurred, and this time proved fatal. No anesthetic, local or general, had been used. If such had been employed, the sudden death would probably have been ascribed to its use.

Confined Suppuration of the Frontal Sinus with Spontaneous Rupture, Including Report of a Case, was the title of a paper by Dr. D. Braden Kyle, of Philadelphia. The patient was a woman, aged 60, who was seen in January, 1898. Her trouble had begun with an initial fullness at the inner angle of the left orbit and a profuse nasal discharge from the corresponding naris. Her face was swollen and the frontal region tender. Two months later

the orbital swelling began to increase in size, and finally a rupture with the escape of pus occurred in the forehead a little to the left of the median line. It took two months after rupture to heal the wound. Dr. Kyle had been unable to find another case identical in all particulars with his own, though several resembled it in many particulars.

The Presence of Partitions and Diverticula as a Cause of Retarded Recovery in the Treatment of Sinuses of the Maxillary Antrum was a paper by Dr. John O. Roe, of Rochester, who remarked that in the treatment of antral diseases we should take into account the position of the sinus, its size, shape, and conformation, the thickness of the walls, and the relation of the tooth-roots to its interior. The above points were demonstrated upon a series of beautifully prepared skulls. Dr. Roe also showed an "antrum searcher," consisting of a probe-pointed flexible steel spring, running in a cannula, and capable of being projected from the latter after it was in the antrum. With this device the cavity could be thoroughly explored through a very small opening. Dr. Roe used a fine saw to enlarge the opening, rather than the rongeur forceps, which were apt to splinter the edges of the bone. Dr. Mackenzie did not think it always necessary to interfere with septums in the antrum. It was important to remember that in some antrums the ostium maxillare was high up and posterior to its normal site. In such cases the discharge would be more apt to drain posteriorly and high up in the nasopharynx, and such location might determine failure in operation. In cases of painful sinusitis, Politzerization of the cavity through the natural opening would often afford almost instant relief, and, in cases of pain extending over a wide area, often enable the determining of the exact point of origin. He was inclined to regard drainage-tubes as pus producers.

"Taking Cold" was considered by Dr. G. V. Woolen, of Indianapolis, who summarized the current views upon this topic. He believed that external influences were reflected upon internal surfaces, thereby causing disturbances of nutrition and the latter produced deficient calorification.

By a series of observations he had found that patients who habitually take cold have a subnormal temperature, even as low at times as 95° in people who appear perfectly well-nourished, and this subnormal temperature may explain much of their indefinite malaise. There is deficient hematosis, and this deficiency appears in the circulatory apparatus through vasomotor agencies. In some persons this condition dates back to improper care as to bathing, etc., during the first week of life. This may be the critical period. If a child passes into adolescence without getting into the "taking-cold" habit, he regarded it as safe in this respect for life. This habit may in some instances be the reflection of hereditary syphilis in the third or fourth generation. This same deficient hematosis may also arise from nasal stenosis and precisely the same train of symptoms be set up. Dr. Goodale said that we must not forget the role played by microorganisms which appear to affect the lymphoid tissue. The symptoms of an ordinary cold are in a mild degree those of an ordinary infection. In moderately severe cases the staphylococcus, and in very severe, the streptococcus predominates. Dr. Bosworth could not quite agree with the preceding speaker, for the rapid onset of a coryza does not always allow bacterial agencies to come into play. We take cold in many ways other than in the head. Acute rhinitis is only a local expression of a general disturbance. Prophylaxis may be summed up in two words, clothing and cold bathing.

During the executive sessions the following were elected to active fellowship: Dr. F. C. Cobb, Boston, thesis, "Peritonsillar Abscess;" Dr. F. J. McKernon, New York, thesis, "A Contribution to the Technic of Modern Uranoplasty;" Dr. Max Thorner, of Cincinnati, thesis, "Direct Examination of the Larynx in Children."

Election of officers for the ensuing year resulted as follows: President, Dr. Samuel Johnston, of Baltimore; first vice-president, Dr. T. Amory De Blois, of Boston; second vice-president, Dr. Moreau Brown, of Chicago; secretary and treasurer, Dr. Henry L. Swain, of New Haven; librarian, Dr. Joseph H. Bryan, of Washington; member of council, Dr. William E. Casselberry, of Chicago. Committee of arrangements, Dr. T. Morris Murray, of Washington.

PROGRAM OF THE SIXTH OTOLOGICAL CONGRESS, TO BE HELD IN LONDON, AUGUST 8-12, 1899.

I.—Normal and Pathological Anatomy.

1. Birmingham, Dr. A. (Dublin).—"The topography of the Facial nerve in its relation to mastoid operations, with specimens."

2. Chatle, Mr. A. H. (London).—"The Petro-Squamosal Sinus."

3. Costiniu, Dr. (Bucharest).—"L'état des oreilles, du larynx, et du nez observé chez les vieillards."

4. Cozzolino, Prof. Vincenzo (Naples).—"Contribution a l'histologie du squelette des cornets pour la pathogénèse de l'ozène." (avec demonstration).

5. Denker, Dr. (Hagen).—"Zur Anatomie des Gehörorgans der Säugethiere, mit Demonstration von Präparaten und Zeichnungen."

6. Rutten, Dr. (Namur).—,'Présentation d'une exostose du conduit auditif droit."

II.—Physiology and Methods of Examination.

7. Baratoux, Dr. J. (Paris).—"L'unification et la mesure de l'ouie."

8. Bonnier, Dr. Pierre (Paris).—"Un procédé d'acoumetrie."

9. Gradenigo, Prof. G. (Turin).—"Sur l'examen fonctionnel de l'organe de l'ouie, et sur la notation uniforme des résultats."

10. Kayser, Dr. Richard (Breslau).—"Experimentlele Untersuchungen über acustische Phaenomene in flüssigen Medien." (mit Demonstration).

11. Schmiegelow, Dr. E. (Copenhagen).—"On a new method of measuring the quantitative hearing power by means of tuning forks."

III.—Pathology and Therapeutics.

12. Avoledo, Prof. (Milan).—"Due casi di complicazioni patologiche della faccia in seguito a propagazione di un processus suppurativo acuto dell 'Orecchio Medio e Esterno."

13. Avoledo, Prof. (Milan).—"Risultati della chirurgia intratimpanica nei riguardi della funzione acustica, ma solo per la forma suppurativa."

14. BABER, Mr. Cresswell (Brighton).—"Turbinotomy in nasal obstruction."

15. BAR, De Louis (Nice).—"Abcès antérieurs de la mastoide et furonculose du conduit auditif externe."

16. BOBONE, Dr. T. (San Remo).—"L'involution précoce du tissu adenoidien sur la Riviera."

17. BRIEGER, Dr. O. (Breslau).—"Uber Tuberculose des Mitteloh s."

18. CHEATLE, Mr. A. H. (London).—"A case of Adenoma of the meatus in a patient suffering with chronic middle ear suppuration."

19. COSTINIU, Dr. (Bucharest).—"Résultats des exercises-acoustiqùes chez les sourds-muets."

20. COZZOLINO, Prof. Vincenzo (Naples).—"Statistiques des mastoidotomies simples et radicales, et des opérations de chirurgie oto-endocranienne pratiquées dans ma Clinique universitaire depuis l'an 1883."

21. COZZOLINO, Prof. Vincenzo (Naples).—"Pseudo-actinomycosis auriculaire externe avec ostéomielite diffuse a la zone mastoidienne, causée par un nouveau bacille filamenteux pyogenique" (avec demonstration.)

22. CURSETJEE, Dr. J. J. (Bombay).—"Some aspects of Aural practice in India, with special reference to Bombay."

23. DADYSETT, Dr. H. J. (Bombay).—"A paper on various domestic remedies with their effects, used by the people of India for certain diseases of the ear."

24. DELIE, Dr. (Ypres).—"Panotite avec complication cérébrale —opération—mort—autopsie."

25. DENCH, Dr. E. B. (New York).—"The Operative Treatment of Mastoid Inflammation."

25. DE SANTI, Dr. P. (London).—"The Radical Cure of chronic suppurative Otitis Media by Antrectomy and Attico-Antrectomy, with notes of thirty cases."

27. DE SANTI, Dr. P. (London).—"Some cases illustrating the Intracranial complications of neglected Otorrhœa."

28. EEMAN, Prof. (Ghent).—"La sclérose de la caisse tympanique."

29. FARACI, Prof. Guiseppe (Palermo).—"Sulla possibilita d riaprire la finestra ovale nei casi di anchilosi ossea della articolazione stapedo-vestibolare."

30. FARACI, Prof. Guiseppe (Palermo).—"Importanza acustica e funzionale della mobilizzazione della staffa."

31. FARACI, Prof. Guiseppe (Palermo).—"Utilita della miringectomia temporanea e consecutiva mobilizzazione di tutta la catena degli ossicini nel periodo sub-acuto di un otite catarrale decorsa senza perforazione timpanica."

32. FISCHENICH, Dr. Fr. (Wiesbaden).—"Die Behandlung der katarrhalischen Adhaesivprocesse im Mittelohre, durch intratympanale Pilocarpininjectionen."

33. GARNAULT, Dr. Paul (Paris).—"Mobilisation (two years ago, and extraction (one year ago) of the Stapes, in the same patient) with great improvement in hearing and typical phenomena."

34. GARNAULT, Dr. Paul (Paris).—"Mobilisation (three years ago) of the Stapes, in a man seventy-two years of age, deaf for forty years, absolutely so for fifteen years, with great and permanent improvement in hearing."

35. GARZIA, Dr. Vincenzo (Naples).—"Experimental study of the influence of malaria in diseases of the ear."

36. GOLDSTEIN, Dr. M. A. (St. Louis, U. S. A.)—"Therapy of the Nasal Mucous Membrane."

37. GRANT, Dr. Dundas (London).—"Diminished 'Bone-conduction' as a Contra-indication of Ossiculectomy."

38. GRAY, Dr. Albert (Glasgow).—"A case of unilateral Deafness caused by a Tumour of the Medulla, producing other remarkable symptoms—Post Mortem" (with microscopic slides of the medulla).

39. GRAZZI, Prof. V. (Florence).—"Nuova cura della faringiti catarrali croniche in rapporto specialmente alle malattie dell 'orecchio."

40. HAIGHT, Dr. Allen T. (Chicago). "Naso-Pharyngeal Adenoids as a causative factor in Ear Diseases."

41. HEIMAN, Dr. Th. (Warsaw).—"De l'inflammation primaire de l'apophyse mastoide."

42. KEIPER, Dr. Geo. F. (La Fayette, Ind.)—"A Description of a set of Mastoid Gouges."

43. LACROIX, Dr. P. (Paris).—"Complications otiques de l'ozéne."

44. LAURENS, Dr (Paris).—"Otite moyenne chronique supurée avec thrombose du sinus latéral et abcès du cervelet."

45. LERMOYEZ, Dr. Marcel (Paris).—"La Contagiosité des Otites moyennes aigues."

46. LUBET-BARBON, Dr. (Paris).—"Note sur les abcès aigus de l'apophyse mastoïde sans abcès de la caisse.

47. LUCAE, Prof. W. (Berlin).—"Zur Radicaloperation bei chronischer purulenter Mittelohrentzündung."

58. MALHERBE, Dr. (Paris).—"Traitement chirurgical de l'Otite moyenne chronique sèche par l'évidement pétro-mastoidien, avec et sans tubage."

49. MELZI, Dr. Urbano (Milan).—"A case of retropharyngeal abscess of auricular origin."

50. MELZI, Dr. Urbano (Milan).—"A case of nasal hydrorrhea."

51. MELZI, Dr. Urbano (Milan).—"A case of endothelioid fibroangioma of the external auricular canal."

52. MENIERE, Dr. E. (Paris).—"Traitement des suppuratïons chroniques de l'attique."

53. MILLIGAN, Dr. W. (Manchester).—"Some observations upon the diagnosis and treatment of tuberculosis disease of the middle ear and adjoining mastoid cells."

54. MINK, Dr. P. J. (Zwolle).—"Pneumamassage unter höherem Drucke."

58. MOURE, Dr. E. J. (Bordeaux).—"Sur quelques cas de complications endocraniennes d'origine otique."

56. MOURE, Dr. E. J. (Bordeaux).—"Sur quelques points de technique à propos de la trépanation de l'apophyse mastoide."

57. NUVOLI, Dr. G, (Rome).—"Sula cura pneumatica nelle malattie dell 'orecchio."

58. OSTMANN, Prof. (Marburg).—"Uber die Heilbarkeit bisher unheilbarer Schwerhörigkeit durch Vibrationsmassage des Schallleitungsapparates."

59. PASSOW, Prof. (Heidelberg).—"Chirurgische Eingriffe bei Sklerose und bei Ménièreschen Symptomen."

60, POLITZER, Prof. Adam (Vienna).—"On the extraction of the stapes, with demonstration of histological preparations."

61. ROHRER, Dr. F. (Zurich).—"On blue ear drums, 'tympanum cœruleum."

62. ROHRER, Dr. F. (Rurich).—"The appearance of varices on the ear drums."

63. RUDLOFF, Dr. P. (Wiesbaden).—"The operation of the removal of adenoid growths with the head hanging over the table, while the patient is under the influence of chloroform."

64. RYERSON, Dr. G. Sterling (Toronto)..—"Objective noises in the ears."

65. SNOW, Dr. S. F. (Syracuse, N. Y.)—"Twentieth Century Prognosis in Chronic Catarrhal Deafness."

66. SZENES, Dr. (Budapest).—"Zur primaerer Erkrankung des Warzenfortsatzes."

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